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VOMITING OF PREGNANCY*

JOHN P. GARDINER, M.D.
TOLEDO, OHIO

The vomiting of pregnancy is a self-limiting disease, characterized by vomiting of a greater or less degree, in some instances so severe that death ensues before the system reacts to this complication.

The symptoms vary from a feeling of fulness in the abdomen and heartburn to vomiting persistently. Observation shows that the conditions associated with the vomiting are different from those of other vomiting. Here an individual, apparently well, with little or no prodromal syndromes, vomits. This vomiting is not associated with any of the usual clinical precursors of vomiting. There is no colic, gas pain, intestinal obstruction, previous operative work or anesthesia. As far as can be seen there should not be any vomiting. The apparent ease with which this vomiting is produced in the normal person gives one the impression that here is an opportunity to study the mechanism of vomiting, with the fewest complications possible. In an effort to make this study, two women were examined by means of the roentgen ray and barium meal. The one, pregnant two months, had been vomiting for the past month and the other, pregnant two months and a half, had been vomiting for two months. They were given 4 ounces of barium solution at 9 o'clock the previous night and 4 ounces in the morning at 8 o'clock during the fluoroscopic examination. The barium settled to the greater curvature of the stomach. During the fluoroscopic examination the movements of the stomach were sluggish, but no signs of reverse peristalsis were observed. Even the artificial attempt to produce the vomiting by irritating the epiglottis was not rewarded with success. Shortly afterward both women vomited the barium without difficulty. In these two instances there was no vomiting during the roentgenologic examination or, most surprising, even when the epiglottis was thoroughly irritated. Yet both gave a history of vomiting all food and both began to vomit again after the examination. It is well known among radiologists that vomiting in many patients can be controlled during the barium diagnostic meal examination but that other patients vomit in spite of all efforts to control them, though roentgenologically nothing pathologic is found in the gastro-intestinal tract.

There is the like experience of trying to suppress a yawn or to control urination or defecation. Which urge can be put off and which cannot is at the start impossible to predict. Alvarez [1] states that the gastro-intestinal tract carries within itself the mechanism essential to peristalsis, and emphasizes strongly that the failure to grasp this point is the greatest stumbling block to the further advance in our understanding of the subject. It is apparent that these functions pass out from under the influence of the cerebrospinal nervous system and become involuntary or more truly primordial functions; that is, they are mixed functions. This cessation or temporary control of vomiting has added a unique chapter to the knowledge of the vomiting of pregnancy. It [2] is a source of discussion in the neurologic literature.[3]

Before the cerebrospinal nervous system was developed, organisms grew, assimilated food, and reproduced. From experience by the trial and error method, we know that there is little power over digestion, growth and reproduction. The breath cannot be held indefinitely, the heart action cannot be voluntarily controlled, nor can the contractions of the uterus be voluntarily controlled. The uterus is an involuntary muscle and therefore is subject to the law of involuntary muscles, which means that it acts independently of the central control. The vagus nerve, the most remarkable of all the cranial nerves, though closely associated with the primordial functions of the body, is still so insufficiently developed that it does not always communicate to the central nervous system the conditions of the organs at its points of distribution.[4] A gastric or intestinal cancer may be allowed to develop past the stage of operability without the slightest indication to the central nervous system, or a relaxed state of the uterus after birth may be allowed to continue until the organ is filled with blood and the patient dies of a postpartum hemorrhage.

That areas of an organism are affected from a distance is shown from clinical and physiologic experience. It is well known that there is a relationship between the appendix and the pylorus, and between the genital and intestinal tracts.[1] Many women while menstruating must refrain from taking a laxative, when at other times a laxative is necessary, showing a definite relationship between the two tracts. Not to enter into the

* This work was done under the H. E. Collin grant.
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1. Alvarez, W. C.: The Mechanics of the Digestive Tract, New York, Paul B. Hoeber, 1922, p. 6.
2. Kaltenbach: Ueber Hyperemesis Gravidarum, Ztschr. f. Geburtsh. u. Gynäk. **21**: 200-268, 1891. Hurst, A. F.: Lancet **1**: 528 (March 18) 1922.
3. The nervous origin of the vomiting of pregnancy is discussed by: Ahfeld: Arch. f. Gynäk **18**: 311, 1881; Zentralbl. f. Gynäk. **15**: 329, 1891.
Giles: Tr. Obst. Soc. London **35**: 303-333, 1893-1894.
Klein: Ztschr. f. Geburtsh. u. Gynäk. **39**: 75-97, 1898.
Winter: Zentralbl. f. Gynäk. **31**: 1497-1504, 1907.
Oldfield, C.: J. Obst. & Gynec. Brit. Emp. **29**: 303-307, 1922.
Audebert-Daleas: Rec. franç. de gynéc. et d'obstét., October, 1926, p. 541.
Cronin, H. J., and Sullivan, E. A.: Boston M. & S. J. **196**: 59 (Jan. 13) 1927.
4. Parker: The Elementary Nervous System, Philadelphia, J. B. Lippincott Company, 1919.

present theories of menstruation,[5] the fact can be accepted that in the menstrual function there is a start and a stop principle. This start principle which brings on menstruation may not only affect the uterus but also penetrate to the intestines, causing a looseness of the bowels by stimulating the intestinal gradient. Up to the time of impregnation, the ovum of menstruation and the ovum of pregnancy no doubt have the same life cycle. By means of the Katsch and Borshes abdominal window method, Westman [6] studied the movement of the tube after the rupture of the follicle. The strong tubal peristalsis in the next hour after the rupture of the follicle makes clear the quick transportation of the ovum through the ampulla of the tube. Where the stimulus comes from has not been determined. Some substance in the follicular fluid may initiate it (the function of the Call and Exner bodies which make their appearance fairly early in the process of follicular ripening is still unknown) or the stimulus may come from the ovum itself.

In a study of the habitat of the ovum in the fallopian tube, Dorothy Anderson [7] determined the number of ova in the different parts of the fallopian tube in a series of pigs by dividing the tube into five parts, beginning at the fimbria and ending with the uterine end. She found in the first part 1 per cent; in the second part, 3.2 per cent; in the third part, 32.4 per cent; in the fourth part, 51.8 per cent, and in the fifth part, 11.6 per cent. This reveals a slowing down in the passage of the ova in the third and fourth portions of the tube, to give the opportunity for impregnation. An observation bearing on this point was made by Sobotta,[8] who found in the fallopian tube of a rat spermatozoa just penetrating the ovum. In 1843 Barry [9] observed directly the entrance of the spermatozoon into the egg. The process of fertilization, the result of which is the activation of the egg, is really a compound of several processes. Activation begins when the sperm cell first comes into contact with the egg substance, resulting in a change of the cortex of the egg and in the elevation of the so-called fertilization membrane. This membrane forms with great rapidity, spreading in some cases from the point of contact of the sperm with the egg over the whole surface of the egg within a few seconds. The elevation of the fertilization membrane is associated with the giving off of the perivitelline fluid.[10] This may be somewhat analogous to the process that takes place in the human being.

The influence of impregnation on the generative organs must be one of inactivity, while that of menstruation is one of activity. This condition of inactivity is probably not brought about by any substance circulating in the blood stream,[11] but its sphere of influence may be purely local and extend by contiguity.[12] On impregnation, this inactive or protective substance may be powerful enough to penetrate through the tube to the closely lying intestine, causing the involuntary muscles of the intestinal tract, in order to protect the ovum, to quiet down, even to such an extent as to simulate a partial or at times complete intestinal obstruction, which in turn gives rise to reverse peristalsis, thus producing the nausea and vomiting.[1] In an effort to witness the movements of vomiting, a dog was given barium sulphate at 9 p. m. and again the next morning at 8:30. The fluoroscopic examination of the stomach, small intestine and colon showed them well outlined. The peristalsis in the stomach and intestine was normal. At 8:45 a. m., 0.06 Gm. of apomorphine was injected into the right buttock. At 8:55 a. m. there was a rapid movement in the jejunum and the upper part of the ileum. The pylorus [13] was fixed and contracted as the cardia opened and the contents of the stomach passed up into the esophagus and immediately appeared at the mouth. There was an interval of quiet. Then a rapid movement began in the upper ileum and jejunum and the bolus passed through the pylorus into the stomach; again the pylorus was fixed and the contents passed through the cardia into the esophagus, appearing at the mouth. Just as one is impressed with the rapidity of the peristaltic movement of the duodenum and jejunum in normal peristalsis, so one is impressed with the rapidity of the reverse peristaltic movement and also with the fact that it begins in the small intestine and not in the stomach.[14]

When a perfectly healthy women becomes pregnant, her chance of suffering from gastro-intestinal disturbance is more than 50 per cent. Of this 50 per cent her chance of showing signs of this disturbance on the first day of her pregnancy is more than 30 per cent.[15] Assuming that there is no difference in the cause [16] of the disturbance, whether it occurs on the first day of the pregnancy (in 30 per cent) or at the sixth week (in 47 per cent) of the pregnancy, it axiomatically can be concluded that the intestinal tract is affected while the zygote is still small. The zygote is able to produce this protective influence in its journey down the remainder of the tube and in the uterus. This protecting substance appears to be associated with the dissolving or penetrating substance of the trophoblast.[17] The majority of the women in the 47 per cent group [11] begin to complain of nausea and vomiting at about the sixth week. It is at this time that the chorionic villi are most active. This activity is greatest for a period of from three to eight weeks, when it begins to subside. By the end of the fourth or fifth month the syncytiotrophoblast and cytotrophoblast, or the layers of Langhans, disappear to be replaced by a single layer of

5. Franke, F.: Handbuch der Frauenheilkunde, Leipzig, 1914, p. 38. Novak, Emil: Menstruation and Its Disorders, New York, D. Appleton & Co., 1921, p. 73.

6. Westman, A.: The Mechanism of Transplantation of the Ovum in Rabbits, München. med. Wchnschr. **73:** 1793 (Oct. 22) 1926.

7. Anderson, Dorothy: J. Physiol. **82:** 557, 1928.

8. Sobotta, J.: Die Befruchtung und Fruchtung des Eies der Maus, Arch. f. mikr. Anat. **45:** 15, 1895; Die entwicklung des Eies der Maus, von Schlusse der Fruchtungsperiod bis zum Auftreten der Amniosfalten, ibid. **61:** 274, 1902-1903.

9. Barry, quoted by Loeb, J.: Mechanistic Conception of Life, Chicago, 1912, p. 114.

10. Rogers: Comparative Physiology, McGraw-Hill Book Company, 1927.

11. Curtis, A. H.: Vomiting of Pregnancy Treated by Injection of Blood of Normal Pregnant Women, J. A. M. A. **62:** 696 (Feb. 28) 1914.

12. Hirst, J. C.: The Control of the Nausea and Vomiting in Pregnancy by Intramuscular Injections of Corpus Luteum Extract, J. A. M. A. **67:** 1848 (Dec. 16) 1916.

13. Cannon: Am. J. Physiol. **3:** 359, 1898.

14. Babsky, E.: Zur Frage des Mechanismus des reflektorischen Brechaktes, Arch. f. d. ges. Physiol. **215:** 692, 1927.

15. Gerst: Contribution à l'etude des vomissements de la grossesse, Paris, 1903.

16. Gueniot: Les vomissement incoercibles de la grossesse, Thèse de Paris, 1863, p. 67. Marcou: Cervical Ganglion as a Possible Factor in the Production of Vomiting, Thèse de Paris, 1878. Horwitz: Ztschr. f. Geburtsh. u. Gynäk. **9:** 110, 1883. Campbell: The Genupectoral Posture: Its Value in Impeded Uterine Reduction and in the Prolonged Nausea and Vomiting of Pregnancy, Tr. Am. Gynec. Soc., 1885-1886, pp. 238-315. Copeman: A Novel Treatment of Obstinate Vomiting of Pregnancy: Dilating the Cervix, Brit. M. J. **1:** 637-638, 1875. Hewitt: On Severe Vomiting During Pregnancy: A Collection and Analysis of Cases with Remarks on Treatment, London, 1890.

17. The etiology is discussed by:
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Harris: Syncytioma Malignum and Ectopic Gestation Causing Pernicious Nausea, Tr. Am. Gynec. Soc. **25:** 364-381, 1900.
Rosenau and Anderson: The Relation of Anaphylaxis to the Toxemias of Pregnancy, Tr. A. Am. Phys. **23:** 54-56, 1908.
Kolmer and Williams: Serum Studies in Pregnancy, Am. J. Obst. **71:** 899-910, 1915; Boston M. & S. J. **173:** 963, 1915.
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Levy-Solal, Balsace and Cohen-Solal: Vomiting of Pregnancy, Compt. rend. Soc. de biol. **95:** 526 (July 23) 1926.

somewhat flattened cells.[18] During this time there is the greatest disturbance in the uterine tissue from the placental development, which necessitates a period of the greatest inactivity on the part of the involuntary muscles of the uterus for the protection of the ovum and corresponds to the usual time of the vomiting of pregnancy. The action of the involuntary muscles and involuntary functions is not well understood because of the lack of data. From my experience, I am led to believe that a protective substance from the zygote influences the genital organs and in turn the intestine. This gives the most logical explanation of the etiology of the vomiting of pregnancy.

It would appear, then, if this idea is correct, that all mammals should be affected by nausea and vomiting, but this does not seem to be the case. The reason for the difference may lie in the fact that man is the only mammal who assumes the upright position and consequently the only one whose intestine rests closely on the genital tract.[19]

PATHOLOGY

The pathologic manifestations of the vomiting of pregnancy, except in rare cases, seem to be little different from those of starvation or inanition. In the two cases in my series which came to autopsy, the only changes were in the liver and kidneys.[20] In one case the periphery of the lobules, and in the other the center, showed cloudy swelling. In the kidneys of both, the convoluted tubules showed cloudy swelling. The glomeruli were shrunken but showed little change. The liver cells reacted to sudan III more prominently than did those of the convoluted tubules of the kidney.[21]

Reactions of Male and Female Rat Prior to Death from Starvation

Male Rat	Female Rat
Nov. 7—No food or water	No food or water
Nov. 8—No food or water	No food; some water
Nov. 9—No food or water; active	No food; some water; active
Nov. 10—No food or water; active still	No food; some water; active very
Nov. 11—No food or water; not so active as female	No food; some water; active very
Nov. 12—At 8 a. m. dying	Female dead

The liver and kidneys of two white rats which had not received any food or water were examined and showed little change. The livers were apparently normal. In the kidneys the convuluted tubules showed cloudy swelling and the glomeruli were unaffected. The liver and kidneys did not react to sudan III.

As soon as the animals had died, an autopsy was performed. The heart of the male, which was still seen slowly contracting, was placed in physiologic solution of sodium chloride. It revived and beat rapidly for ninety seconds, then stopped completely. There was no effect on the female heart. The intestines of both rats recovered their tone when placed in physiologic solution of sodium chloride. These pathologic observations are not typical of a picture of death due to an extreme hepatic or nephritic toxemia.[22]

It is interesting to speculate on the immediate cause of death in the vomiting of pregnancy. Near the end, three things usually happen. Before death the patient miscarries, as did the three patients in my series. The stomach becomes retentive, food being taken without the occurrence of vomiting, thus often masking the seriousness of the patient's real condition. The change is probably due to the fact that now the muscles of the intestines can no longer be stimulated, or perhaps the protecting substance is no longer formed, as the terminal miscarriage has probably started and the impulses are not being sent out. Then there is the apparent suddenness with which the change for the worse sets in. No medication gives any relief. The impression clinically is that the patient dies from what we might term, for the present, exhaustion. This state may be the same as that which Mann[23] found in the hepatectomized dog. There is often not enough visible pathologic change found at autopsy to account for the change that takes place a few hours before death.

In my experience with the uterine muscle, a muscle of the nonstriated variety, I have found that the involuntary muscle does not show fatigue as distinctly as does the striated variety, but that the former after a period of stress continues to function apparently normally[24] and then enters into a state of relaxation, which is fatal unless the organ can be stimulated, as in atony of the uterus in postpartum hemorrhage. It is my belief that the immediate cause of death is some factor contributing to exhaustion from the strain of the involuntary system caused by persistent vomiting.

TREATMENT

If further study proves, as I have suggested, that the cause of the vomiting of pregnancy is a substance formed which compels the genital system to take on a function for the protection of the zygote, the treatment consists in limiting its spread from the genital organs to the intestine. A specific remedy may be found for this limitation. Experience has proved in the great majority of cases that, after a time, the nausea and vomiting abate. If, however, it does not cease, further formation of the protective substance can be prevented and a cure established by performing a therapeutic abortion, which, if taken in time, has never failed in my cases to stop the vomiting immediately. When to produce the therapeutic abortion is the crux of the treatment in the vomiting of pregnancy. Always it is the desire and the obligation of the obstetrician to allow the woman to go as long as possible without intervention in the hope that the vomiting will cease and the pregnancy be brought to term.

There are, then, three points for consideration in the treatment: the limiting of the vomiting, the supportive treatment, and the cure by the induction of a therapeutic abortion.

LIMITING THE VOMITING

Even though the nature of the protective substance is not known, the effort must be made to limit its influence on the intestine. This limitation at the present time can be brought about only indirectly. I pursue two methods to accomplish this result. The first has for its object the separation of the two tracts (genital and intestinal) as far as possible. The patient is required to lie face downward and the foot of the bed is elevated, so that the buttocks are a few inches above

18. Gray's Anatomy, Philadelphia, 1924.
19. Budin, P.: The Relation That the Uterus Bears to the Intestines in Obstetrics and Gynecology, Internat. Clin. **3**: 281-285, 1893.
20. Lindemann: Zur pathologische Anatomie des stillbaren Erbrechen der Schwarrgerenne, Centralbl. f. allg. Path. u. path. Anat. **3**: 625-630, 1892.
21. Mottram: Am. J. Physiol. **38**: 281, 1909. Cope and Mottram: Fatty Acid Metabolism of the Liver During Pregnancy and Lactation, ibid. **49**: 23, 1914.
22. Williams: Bull. Johns Hopkins Hosp. **17**: 71-92, 1906; Am. J. M. Sc. **132**: 343-354, 1906; J. Obst. & Gynec. Brit. Emp. **22**: 245-265, 1912. McLeod: J. Lab. & Clin. Med., 1917, pp. 520-522. Losee, J. R., and Van Slyke, D. D.: Am. J. M. Sc. **153**: 94-100 (Jan.) 1917.
23. Mann, F. C.: Modified Physiologic Processes Following Total Removal of the Liver, J. A. M. A. **85**: 1472-1475 (Nov. 7) 1925.
24. Gardiner, J. F.: Acute Dilatation of Postpartum Uterus as a Cause of Postpartum Hemorrhage, J. A. M. A. **73**: 1915 (Dec. 27) 1919.

the level of the shoulders.[25] The bed is arranged to prevent any sagging, so that the strain of the sacral and lumbar regions is reduced to the minimum. This position causes the greatest separation of the two tracts. The second has for its object the reduction of the sensitiveness of the involuntary muscles of the intestine. This is accomplished by the use of sedatives, thereby emphasizing the logical therapeusis of sedatives in the vomiting of pregnancy.[26] Bromides, choral, the barbital group, and, in emergencies, codeine or morphine are used. It is important that the ambulatory patient should have sufficient rest at night. She should lie face downward as much as possible with the shoulders below the level of the buttocks, so that the digestive burden may be reduced to the minimum.

SUPPORTIVE TREATMENT

Nourishment in the vomiting of pregnancy is receiving attention [27] as refined laboratory methods are being transfered to practical therapeutics. That these women are undernourished is shown by the following case history, which also illustrates the treatment in vogue ten or fifteen years ago, when foods and fluid were given by the mouth and sometimes by bowel: [28]

CASE 1.—Mrs. B., a primipara, began vomiting at the end of six weeks. After three weeks she was admitted to the hospital. After seven weeks of vomiting I saw her. She had weighed 148 pounds (67 Kg.), but when seen she weighed only 105 pounds (47.6 Kg.). She was greatly emaciated and very weak. The patient vomited all fluids and solids taken. The uterus was enlarged, and could be felt above the pubes; it was soft and its contents were irregular in outline. A dead fetus of three and a half months was diagnosed. After a therapeutic removal of a macerated fetus, the vomiting ceased and in the next week there was a gain of 20 pounds (9 Kg.). This case is typical of great emaciation. After seven weeks of vomiting, apparently without deleterious effects, the patient's recovery was complete.

In order to note the effect of starvation and dehydration, a dog for eight days was fed as usual but received at first, once a day, then twice a day, and then three times a day, 0.03 Gm. of apomorphine hydrochloride hypodermically. He lost weight. Then for twenty-nine days he was not given any water or food. At the end of twenty-nine days he had lost 25 pounds (11 Kg.) but was still able to jump up and was interested. He was then given a pint a day of a solution of .25 per cent dextrose by mouth for forty days; he became lively and growled at his neighbor but did not gain any weight. To determine the result of vomiting accompanying starvation and dehydration, another normal dog was not given any food or water, but received 0.06 Gm. of apomorphine hydrochloride morning and night, which caused him to vomit two or three times after each dose. Toward the last of the thirty-two days he vomited very little and many times only retched. The last ten days he was lying down most of the time, and when noticed he would not get up as formerly but would just wag his tail. He was much weaker than the other dog and developed an inspiratory dry murmur. He was then given 1 pint of .25 per cent dextrose solution daily for forty days. He was lively but did not increase in weight.

It was a point of interest to learn that a dog could exist for twenty-nine days without food or water and at the end of that time be what one could call active, and that another dog vomiting twice daily could at the end of thirty-two days wag his tail and walk about. One fact in the three instances here given provokes the query: May not starvation and dehydration be a benefit—a method of conservation and defense? Dried apples and prunes preserve their nutriment; the mummy is preserved by dehydration; we know that the aged are thin, and that infection spreads slowly in dehydrated tissue. It would seem that more study is needed for the solving of these questions.

That supplying fluid to the system intravenously is not sufficient is well illustrated in the following case:

CASE 2.—Mrs. D., a primipara, seen in November, 1924, began vomiting, which continued for six weeks, shortly after impregnation. She vomited all nourishment and in the intervals between taking nourishment. She was cheerful and of a phlegmatic type. One thousand cubic centimeters of physiologic solution of sodium chloride containing 10 per cent dextrose and 1 per cent sodium bicarbonate was given intravenously every day for the following thirty-two days. The output of urine increased. After a week, when no improvement had occurred, I advised that a therapeutic abortion be performed but the advice was not taken. Later the tissue showed the effect of the dehydration. When the patient received the intravenous injection, the tissue would fill out at first, but in an hour or so it would begin to wrinkle again. Because of an unavoidable absence from the city, I allowed the patient to pass from my care, and the subsequent history states that the treatment was carried out for five days, after which the patient was able to retain food. At the end of four more days there was a sudden change for the worse, and she aborted and died.

This history shows a remarkable tolerance to intravenous administration, one injection having been given every day for thirty-two days. Not one injection was followed by a reaction. Two incidents in the history of this case only emphasize the fact already stated that before death vomiting ceases, and there occurs an uninduced miscarriage. The question comes up for consideration as to how much fluid the body really needed. There was an impression that the water passed out as freely as it was administered, by using the cells of the kidneys in the capacity of a sieve, probably adding an additional strain. It may yet be proved that it is not wise to disturb the intravascular pressure in all cases by intravenous administration, for the defenses of the organism may be interfered with.

One of the weak points in the intravenous therapy today is the uncertainty as to the amount of fluid to be injected.[29] It is known that no two individuals tolerate the same amount of fluid, as no two individuals have the same intravascular tension. In administering fluid to the body intravenously or by hypodermoclysis, the

25. Denman: Horizontal Position, quoted by Kuchenmeister, Wien. med. Wchnschr. **32**: 1854. Grant, J.: Elevation of the Pelvis as a Means of Relieving Vomiting of Pregnancy, Montreal M. J. **19**: 894, 1890-1891.

26. Champetier de Ribs: Galvanism, Bull. et mém. Soc. méd. d. hôp. de Paris **12**: 216-221, 1895. Bar and Bleufait: Galvanism, Bull. et mém. Soc. obst. et gynéc. de Paris, 1895, pp. 401-414.

27. Metabolism in the vomiting of pregnancy is discussed by:
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Stolper: Gynäk. Rundschau Zentralorg. Geburtsh. u. Frauenklinik **8**: 85, 1914.
Dieckmann, W. J., and Crossen, R. J.: Am. J. Obst. & Gynec. **14**: 3 (July) 1927.

28. Campbell: Rectal Alimentation in Nausea and Inanition of Pregnancy (patient maintained nutrition for fifty-two days, aborted and recovered), Tr. Am. Gynec. Soc. **3**: 268, 1879.

29. Rogoff, J. M., and Stewart, G. N.: Am. J. Physiol. **84**: 649 (April) 1928. Miller, J. R.; Keith, N. M., and Rowntree, L. G.: Plasma and Blood Volume in Pregnancy, J. A. M. A. **65**: 779-782 (Aug. 28) 1915.

amount to be injected should probably equal the amount the gastro-intestinal tract will absorb. More than this may be harmful. May it not yet prove to be unphysiologic, when adding fluid to the organism, to shunt the portal radicles, the thoracic duct, the lymphatics, and the blood vessels of the intestinal tract as we do now empirically in administering fluid intravenously and by hypodermoclysis? If it is necessary to administer fluid, there are few times when it cannot be given by the intestinal tract;[30] especially is there no contraindication in the vomiting of pregnancy.

The necessity of administering food other than carbohydrate for the support of the organism seems less urgent today than was formerly believed, as the experiments with the two dogs show.[31] After thirty days of starvation and dehydration they were given by mouth, arbitrarily, 1 pint of a 25 per cent dextrose solution. They did not gain in weight [32] but, although thin, they were apparently in good condition at the end of seventy days.

The method of treatment I am using at present may be illustrated by the following case report:

CASE 3.—Mrs. L., a secundipara, whose first pregnancy was uneventful except for light nausea for a week or two, became nauseated in the present pregnancy about the fourth week and by the sixth week the nausea was severe. There was vomiting immediately after the taking of food or liquid. Before I saw the patient she had been treated with corpus luteum without any apparent effect. She was a well nourished woman (though she asserted that she had lost weight) with a slight fulness of the thyroid; the chest and abdomen were normal. The urine was normal. The uterus was enlarged, indicating a two and one-half month's pregnancy. The bowels were constipated, moving only by enema. The pulse ranged from 100 to 110, and the blood pressure was 120 systolic and 70 diastolic. The patient was weak and hardly able to sit up. The routine treatment was instituted. The foot of the bed was elevated and she was urged to lie face downward. Morphine, 0.016 Gm., and scopolamine, 0.004 Gm., were given, and the bowels were saturated by the drip method with physiologic solution of sodium chloride containing 1 per cent sodium bicarbonate and 15 per cent dextrose. The vomitus reduced Fehling's solution. The vomiting grew less the second day, and by the third day it was only occasional. One ounce of cold milk containing a teaspoonful of dextrose was given every hour and phenobarbital sodium, 0.09 Gm., was given every twelve hours. She was instructed to lie with the foot of the bed elevated and face downward at intervals and at night for the following two weeks. Recovery was complete.

Two other severe cases which came under my care were treated in the same way with like results—in each instance the vomiting was reduced and the patients were soon able to take solid food. This method of treatment is the most successful I have tried.

THERAPEUTIC ABORTION

There is in obstetrics no more difficult question than that of the proper time to perform a therapeutic abortion, and it is a question on which there is as yet no unanimity of opinion. There is not only the problem of the time but also that of getting three physicians (the law in the state of Ohio) to concur in the opinion that the patient will die unless the abortion is performed. As consultant one is placed at times in the anomalous position of seeking to complete a jury. For example, one physician has in all his experience never seen a woman die and he has seen some pretty sick women. Another affirms that they get along better if nothing is done, as every patient he has known to have had an abortion performed has died. A third may hesitate because of his religious attitude. All of these opinions are honest and worthy of respect, but they cause delay when one has made up one's mind that, for the sake of the patient, the uterus must be emptied. At present the best time for the operative treatment can only be said to be arbitrary, no matter by whom it is set. The rule which seems to be becoming general is that after a week or ten days of active treatment, if there has not been any improvement, there should be operative intervention.

The method used in removing the contents of the uterus depends on the dilatability of the cervix and also on the size of the child. If manual dilation is possible it should be done, as there is less likelihood of trauma when the pressure is directly under control. If dilation is not done manually, it should be done by careful instrumental manipulation. If it is necessary to empty the uterus before the second month, it may be difficult even with the finger in the uterus to differentiate the fetal envelop, on account of the thickness of the membranes, but after a little persistence its resilence can be distinguished from the uterine wall. The membranes are then ruptured and the fetus and placenta removed. It may be necessary, on account of the size of the child, and the resistance of the cervix, to introduce a Voorhees bag. The size of the bag should be proportionate to that of the fetal head. There is no operation that gives more satisfactory results. The cessation of vomiting is immediate. However, no therapeutic abortion can be undertaken lightly, for the mortality rate from infection of all induced abortions is high, no matter what the indications. Therefore the giving of consent to a therapeutic interruption of pregnancy is recommended only after due deliberation.

CONCLUSION

1. The vomiting of pregnancy is a self-limiting disease.

2. Vomiting, as with yawning, respiration, urination and defecation, is a mixed primordial function.

3. Menstruation is associated with an increased intestinal gradient and pregnancy is associated with a decrease, possibly the result of a substance given off by the chorion of the zygote.

4. The time of greatest activity of the chorion corresponds to the time of the greatest frequency of the vomiting.

5. Experimental work on dogs has shown that the pathologic changes induced by the vomiting of pregnancy are difficult to distinguish from those of inanition.

6. The human being, because of the upright position, is the only mammal subject to the vomiting of pregnancy.

7. The immediate cause of death is probably exhaustion.

8. The value of the inverted ventral posture is that it separates the genital and intestinal tracts.

9. The employment of sedatives is logical.

10. Enteroclysis is safer and is a more rational guide to the amount of fluid needed than intravenous administration or hypodermoclysis.

11. The inverted ventral method has been used with success in three cases.

2455 Collingwood Avenue.

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31. Deuel, H. J., Jr.; Sandiford, Irene; and Boothby, W. M.: J. Biol. Chem. **76**: 391, 1928.
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CARDIAC DISEASE IN PREGNANCY

PROGNOSIS; MEDICAL AND OBSTETRIC HANDLING *

BURTON E. HAMILTON, M.D.
Cardiologist, Boston Lying-In Hospital
AND
FOSTER S. KELLOGG, M.D.
Instructor in Obstetrics, Medical School of Harvard University
BOSTON

We are convinced that the problem of heart diseases complicating pregnancy is not generally understood. Though nearly 20 per cent of the maternal deaths at the Boston Lying-In Hospital in a four year period and 28 per cent of the maternal deaths at the Faulkner Hospital, Boston (private obstetric wing), in a seven year period were furnished by patients with seriously injured hearts, only about 1 per cent of all pregnant patients have seriously injured hearts. This hinders obstetricians from personally observing large numbers of cardiac cases and masks their importance.

The following brief outline of the principal points in the problem is based on seven years' intensive study of heart diseases in pregnant women at the Boston Lying-In Clinic, and on our experience in private cases. (The statements we make dogmatically could be supported by case analyses were there space. When we necessarily speak from opinion, we will say "we believe.")

The Boston Lying-In Hospital formerly depended on casual consultation for cardiac cases. Decompensated patients with heart disease were common. Maternal and baby death rates among them were high. With the development of the prenatal clinic, patients with heart disease were referred to a cardiac clinic in a general hospital with a marked improvement in cardiac diagnosis. But it was not until a cardiac clinic was established in the Boston Lying-In Hospital, and the same cardiologist followed patients through pregnancy, delivery and the puerperium, that clear classification of patients was obtained and valuable data were collected, leading to satisfactory rules for the control of patients and the reduction of the death rate. We believe that similar obstetric clinics elsewhere can profit by this example.

Patients with heart disease, or conditions suggestive of heart disease, at the prenatal clinic are referred to the cardiac clinic. The number thus referred is approximately 7.5 per cent of all the patients seen at the prenatal clinic. In the cardiac clinic, these patients are sorted into groups according to the type of heart disease, and each group is studied separately. By far the most important disease group is rheumatic heart disease. There are smaller but important groups of patients with congenital heart disease, cardiovascular syphilis, hypertensive heart, thyroid heart, or disorders of the heart beat, such as: paroxysmal tachycardia. Another large group cannot be diagnosed as having definite heart disease nor dismissed as not having heart disease, and these are classified as having "possible" heart disease. This group includes most of the patients in whom the principal evidence suggestive of an abnormal heart is a more or less loud systolic murmur. In another important group the patients have "no heart disease" but are sent to the clinic for symptoms falsely suggesting heart disease; for example, breathlessness, syncope, pain in the region of the heart, simple tachycardia and extrasystoles. For purposes of obstetric control, all the cardiac clinic patients can be separated into three classes:

In class 3 are those definitely without heart disease. The majority of these are patients with cardiac neurosis or neurocirculatory asthenia. They are often troubled by their symptoms to an extent that is alarming to them and often to their physician. It is reassuring to have a consecutive series of 149 such patients classified at the Boston Lying-In Hospital as being without maternal deaths. We have seen only one such patient die, a private patient. This woman died suddenly and unexpectedly after a cesarean operation. Autopsy was not permitted.

Class 2 contains all the "possible cardiacs" and those believed to have rheumatic heart disease, congenital heart disease, or any other cardiac condition, but who do not show clear signs of severe injury. In a series of 276 such cases at the Boston Lying-In Hospital there have been two maternal deaths. No patient has shown signs of decompensation. The two deaths were from complications not associated with the heart.

Cardiac patients in class 3 and class 2 have been treated obstetrically as though they were normal so far as the heart is concerned.

Class 1 contains patients with severely injured or disordered hearts. With very few exceptions, they are so classified because they have a considerable enlargement of the heart, or a diastolic murmur, or both. A very few have been grouped in class 1 because of a very loud or harsh systolic murmur accompanied by a thrill, with usually additional minor signs of an injured heart, or because of serious disorder of the heart beat without other signs of an injured heart.

In a consecutive series of 252 class 1 patients at the Boston Lying-In Hospital there have been twenty-one maternal deaths, and seventy-three have shown signs of a failing heart.

The value of this classification is thus clearly shown. One can select a group (class 1), about one third of all patients suspected of having heart disease, among whose members the maternal mortality is high and the incidence of disability from heart failure is high. Class 1 cases require very special care. In class 2 and class 3 patients the heart condition can safely be disregarded so far as pregnancy is concerned.

It is highly desirable to differentiate, before or early in pregnancy, class 1 patients who will tolerate pregnancy well from those who will not. We have found that patients who have or have had heart failure, or some much less common complication, such as an auricular fibrillation or a hypertension, do not tolerate pregnancy well. We have grouped these as class 1 A. We believe that these indications justify warning a patient against pregnancy, therapeutic abortion of the patient if seen early in pregnancy, and sterilization when practicable. After exclusion of patients with these complications, which we group in class 1 A, we have found few other criteria for differentiating the better from the worse pregnancy risks among cardiac patients. To be sure, we have noted that a number of noticeably small women with mitral stenosis have not, as a group, borne pregnancy well. We believe, basing this opinion also on our experience in a few cases, that acute rheumatic fever contraindicates pregnancy, for cardiac reasons, for at least a year, and justifies thera-

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 14, 1928.

peutic abortion when it occurs early in pregnancy. Rheumatic fever in pregnant women is rare.

We have found that effort tests and vital capacity determinations are not practical in differentiating class 1 cardiac patients who cannot be put in class 1 A into good and bad pregnancy risks. Indeed, interest in trying to discover some obscure physical difference between class 1 patients who will tolerate pregnancy well, and those who will not, wanes with experience. The important point in the prognosis of class 1 patients is whether or not they are properly controlled and treated. This is clearly shown in the accompanying table.

Prognosis in Class 1 Patients

Year	Number of Cases	Number of Deaths	Death Rate
1922	33	7	21.2%
1923	37	6	16.2%
1924	35	3	8.6%
1925	35	1	2.8%
1926	40	2	5.0%
1927	72	2	2.7%

In the three years 1922-1924 inclusive there were 105 cases with a maternal death rate of 15.2 per cent. From 1925 to 1927 inclusive there were 147 cases, with a maternal death rate of 3.3 per cent.

MEDICAL CONTROL OF PATIENTS

We have found from experience that satisfactory medical control of class 1 patients in pregnancy consists principally in rigid observance of a few fundamental rules.

Accurate Diagnosis.—Part of the reason for the reduced death rate among cardiac patients in the Boston Lying-In Hospital is accurate diagnosis. We have frequently, in the early days of the clinic and in private practice, seen women who first learned that they had a heart disease and were first treated for it when they were pregnant and already suffering from severe heart failure. More than 90 per cent of cardiac patients in pregnancy, classed as having severe heart injury are so classed because they have a mitral stenosis. The diagnosis of mitral stenosis is based on a characteristic murmur. It is very difficult to learn to diagnose this murmur correctly. It is sometimes overlooked. It is very often wrongly suspected. It should be searched for specifically in each pregnant woman at her first examination. Though the obstetricians who examine the patients in the prenatal clinic at the Boston Lying-In Hospital are unable to diagnose mitral stenosis, they are now on the alert for symptoms of heart disease; they examine hearts with interest and refer all suspected cases for diagnosis. The most important protection against the danger of overlooking, and also of erroneously diagnosing mitral stenosis in general obstetric practice, in our opinion, is to advertise the importance of mitral stenosis and its accurate diagnosis in obstetrics. To illustrate: At one cardiac clinic meeting, ten patients were seen who had been referred from the prenatal clinic, nine because of a "systolic murmur." Three of these had mitral diastolic murmurs—mitral stenosis. One, referred as having "mitral stenosis," proved not to have it but had a simple prolonged first heart sound. If these patients had been treated on the obstetric diagnoses, one would have had needless and expensive care (class 1). Three who belonged in class 1 would have been placed in class 2, given no special care and thereby subjected to greatly increased risk of life.

Early Recognition.—With improving organization of outpatient clinics and gradual instruction of the community from which the patients are drawn, the cardiac clinic patients are reporting earlier.

Stubborn Prenatal Control of Cardiac Patients.—Adequate description of this would require much space. To summarize briefly, most of the cardiac patients who die in pregnancy die of ordinary congestive heart failure.

The causes of congestive heart failure are usually (1) overexertion and (2) infections, such as colds, grip and tonsillitis.

1. Each patient receives personal instruction designed to cover her special living conditions; for example, with regard to hours of rest, number of times to climb stairs, amount and nature of housework and diet. The patients are always forbidden to shop, and they are warned against attempts to exercise.

2. Patients are warned that at the onset of the slightest illness they are to go to bed at once and notify the hospital. It is almost the rule for cardiac patients to catch some more or less mild epidemic infection during pregnancy. If they go to bed at once, they seem to tolerate these infections as well as do normal patients. If they continue to stay up and about, they often develop heart failure.

At times, patients develop heart failure without being aware of it. The first reliable physical sign is nearly always persistent râles at the lung bases. Class 1 cardiac patients should be examined, with this sign particularly in mind, at least once a week throughout pregnancy for early discovery of failure. The disregarding of this sign has been clearly shown to us to be a dangerous matter. The earliest important symptom of failing heart of which the patients are aware is often cough on exertion or after lying down, and sometimes hemoptysis. Patients often think that they have a cold. They should be instructed to report at once should cough or hemoptysis occur.

When failure once occurs, patients belong in the hospital or under hospital conditions until delivered. This should be a law. When it occurs in a patient who is up and about, whether infection is present or not, it usually clears after a sufficient rest in bed. It is here that the most troublesome decisions have to be made. Though in a few cases we have seen patients, whose hearts failed early in pregnancy because of unusual exertion, get over the failure with rest in bed and, when allowed to be up, go through pregnancy successfully under careful restrictions, long experience shows that this is a very dangerous procedure. Patients should be advised strongly to have pregnancy interrupted if failure occurs early in pregnancy. If failure occurs in the last months of pregnancy and is promptly relieved by rest in the hospital, the patient may be encouraged to continue the pregnancy in bed in the hospital until the child is viable. This is also a dangerous procedure. We have seen a few such patients unexpectedly develop failure again while in bed. Failure occurring thus, while the patient is under the easiest conditions possible, is practically impossible to relieve and the patient must then be delivered while in failure.

If a woman, late in pregnancy with failure, is allowed to continue pregnancy after failure is relieved in order to obtain a viable child, she should be delivered as soon as there is reasonable evidence that the child is probably viable.

METHODS OF DELIVERY

We believe definitely that the easiest way to deliver a patient with heart disease, so far as the strain on the heart is concerned, is by cesarean section. Nevertheless, because of the feeling that this adds necessarily a risk in itself, we try to avoid a cesarean operation as much as we dare. We select it only for those in heart failure, unless they are advanced in labor when first seen, and for obstetric reasons. The majority of our primiparas with cardiac disease have been delivered by cesarean section. The other patients have been eased through the first stage by means of morphine, scopolamine and obstetric ether and have been delivered at full dilatation by forceps, rarely by version.

We have tried, over a good many years, many methods of anesthesia on cardiac patients for obstetric and other reasons, but no clear indications for special choice have resulted. We are convinced that there is a great difference in the strain resulting from skilfully and less skilfully given anesthesia. With skilled anesthetists, we have watched patients with heart disease go through prolonged operative delivery and anesthesia of many varieties with equal smoothness.

Opinions in the hospital vary as to the choice of anesthesia. Many cesarean sections have been done there under scopolamine-morphine and local anesthesia. They are now being done with apparent success under the newer spinal anesthesia. The obstetric author of this paper has not had personal experience with the latter and has theoretical objections to it. With morphine-scopolamine and local anesthesia he has had two deaths. His own choice at present, whether the patient is in failure or not, is a single dose of morphine-scopolamine followed by very carefully given drop ether on gauze or, in the hands of an expert anesthetist, ether-oxygen vapor from a mixing machine. Contrary to the opinion of some of his colleagues, he believes that speed is an important element in a cesarean operation in a patient with decompensated heart and that speed is best attained by this method of anesthesia. He has yet to see properly given ether do harm to a patient with heart disease, and in his own practice he reserves the use of scopolamine-morphine and local anesthesia for cases of kidney complications of any sort.

There will never be a really satisfactory method of delivering a woman in heart failure. All methods are more or less dangerous. The same patient, when not in failure, is a much safer risk for any method. We wish to emphasize this and our belief that ingenious methods of delivery are not the important thing in handling cardiac patients in pregnancy. The most important thing is prenatal control, which will have the patient in good condition at the time of delivery. We have found it to be a very grave and common mistake for an obstetrician or consulting cardiologist to decide to allow a cardiac patient, seen early in pregnancy, to try to go to term, and, if she does not do well, to interrupt the pregnancy.

There are practically no warning signs to enable one to prophesy an impending failure. The first common trustworthy sign that a cardiac patient is not doing well in pregnancy (persistent râles at the lung bases) is actual evidence of failure itself. Pregnancy should not be allowed to continue if the patient has or has had failure, or if she has a dangerous complication. If she does not have these complications, she should be guarded against failure. If it occurs, in spite of all precautions, it should be recognized early, relieved, and the patient delivered before it returns. Delivery of a patient in heart failure should be regarded as an indication that some one has blundered. Nearly always in checking up such cases we find that the history suggests strongly that proper precautions at the right time would probably have avoided the situation.

475 Commonwealth Avenue—19 Bay State Road.

[EDITORIAL NOTE.—This paper, together with that of Dr. Gardiner, which precedes it, and the papers of Dr. Singer and Drs. Mussey and Keith, to appear next week, constitutes a symposium on pregnancy. The discussion will follow the papers to be published in our next issue.]

THE TREATMENT OF NEPHRITIS AND NEPHROSIS WITH EDEMA *

EDWIN G. BANNICK, M.D.
AND
NORMAN M. KEITH, M.D.
ROCHESTER, MINN.

A hundred years ago, Bright [1] first showed the frequent association of dropsy, albuminuria and diseased kidneys. Since then there have been many advances in histologic technic. The kidneys have been studied intensively both in health and in disease, and yet an exact relationship has not been established between the formation of edema and the presence of albuminuria and structural abnormalities of the kidney. Newer methods of study have broadened the conception concerning these and other closely allied factors, so that the problems of nephritis are now regarded as both renal and extrarenal. These facts led Volhard and Fahr [2] in 1914 to assemble the known clinical, laboratory and pathologic data in order to reclassify the various types of so-called renal disease. We here present a series of such cases in which edema was present and discuss suitable methods of treatment.

TYPES OF CASES STUDIED

In order that we might study carefully and comparatively various therapeutic measures and gain a fair idea of the results of our attempts at treatment, we selected, somewhat arbitrarily, 100 cases of nephritis and nephrosis with edema. We tried to choose cases as nearly typical as possible in each type of the disease and those in which edema was a troublesome symptom and thorough study and treatment had been carried out in the hospital. The cases were divided into five groups: (1) acute diffuse glomerulonephritis; (2) acute renal insufficiency; (3) subacute or chronic glomerulonephritis; (4) chronic nephrosis, and (5) chronic nephrosis of the mixed type. Ten of the cases were acute and ninety were subacute and chronic; more of the latter group were selected because of the more difficult therapeutic problems presented. Since the series of ten cases of acute nephritis is too small from which to make statistical deductions, we chose cases in which the patients apparently had recovered completely, five of acute diffuse glomerulonephritis, and five of acute renal insufficiency; the latter have been recently designated as acute infectious nephrosis or acute toxic

* From the Division of Medicine, the Mayo Clinic.
* Read before the Section on Pharmacology and Therapeutics at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 14, 1928.

1. Bright, Richard: Reports of Medical Cases Selected with View of Illustrating the Symptoms and Cure of Diseases by a Reference to Morbid Anatomy, London, Longman, 1827-1831.
2. Volhard, Franz; and Fahr, Theodor: Die Brightsche Nierenkrankheit, Klinik, Pathologie und Atlas, Berlin, J. Springer, 1914.

nephrosis and probably correctly so, but we shall refer to them by the simple clinical term of acute renal insufficiency. Of the ninety more chronic cases, forty were typical of subacute or chronic glomerulonephritis, twenty-five were classic examples of chronic nephrosis and twenty-five were cases in which the nephrosis element predominated markedly, but which were not classified as typical chronic nephrosis because of the limitations we have placed on this term in this grouping. They were, therefore, classified as chronic nephrosis of the mixed type.

TABLE 1.—*One Hundred Cases of Nephritis and Nephrosis with Edema Traced*

Type of Nephritis	Patients Studied	Patients Dead No.	Patients Dead %	Patients Living: Apparently Cured	Free of Symptoms	Definitely Improved No.	Definitely Improved %	Course Undetermined	Steadily Failing
Acute glomerulonephritis..	5*	..	..	5	..	..	..	..	..
Acute renal insufficiency...	5*	..	..	5	..	..	..	..	..
Subacute and chronic glomerulonephritis.....	40	24	60	..	3	6	15	5	5
Chronic nephrosis.....	25	2	8	2+†	10†	20	80	3	..
Chronic nephrosis (mixed type).....	25	10	40	..	3	13	52	2	..

* Selected.
† More than two of the patients free of symptoms may be cured.

A case was not included in the group of chronic nephrosis unless at least moderate edema had existed for several months without demonstrable diffuse vascular involvement. The systolic blood pressure was not above 140 mm. nor the diastolic above 90 mm., and the heart appeared to be of normal size. Albuminuria was constant, and hematuria was absent or only a few erythrocytes were present. Retinitis was not present. Blood urea values were below 40 mg. for each 100 cc. The erythrocyte count averaged 4,000,000 or more, and practically all cases showed the characteristic changes in the lipoid and protein concentration of the blood serum, as demonstrated and emphasized by Epstein.[3] A summary of the therapeutic results in all of the cases is given in table 1.

TREATMENT

In discussing the treatment of such complex conditions as nephritis and nephrosis with edema, it did not seem advisable to attempt to present for consideration all of the various therapeutic measures that have been recommended. We have chosen to outline those measures with which we have had the most experience and which have proved the most useful in our hands.

Acute Diffuse Glomerulonephritis (chart 1).—It is well to bear in mind that many features in the course of the disease suggest that it is often self-limiting in nature. We have all observed cases of carelessly treated patients who recovered, and of carefully treated patients who died or whose nephritis became chronic, and yet we should not hesitate to outline a rational regimen for patients to follow.

Patients suffering from acute glomerulonephritis with edema should be in bed and warm during the early part of the disease. It is an open question as to how long such patients should be confined to bed. We believe that, in most cases, after the edema has disappeared, the blood pressure is normal, free output of urine is established, and hematuria has subsided or markedly diminished, the patient should get up. Precautions should be taken to see that he is kept warm and that his activities are increased very slowly and cautiously. Failure on the patient's part to observe these last two rules has accounted for some of the failures that have been attributed to "getting up too soon."

In prescribing a diet it is well, with certain reservations, to follow closely the axiom of many German physicians in outlining treatment in such cases: "food and fluid starvation." The diet should be low in salt, protein and water, and should not contain, in the beginning, more than the usual basal caloric requirements. Usually the limitation of protein to 40 Gm., salt to 3 Gm., and water in the food to approximately 1,200 cc., with an allowance of from 600 to 1,000 cc. of extra fluid daily, is sufficient to control the edema. If, however, after several days of this diet, the response is not satisfactory, we prescribe one of the diets low in water and mineral content,[4] and which contains only approximately 1 Gm. of salt and 800 cc. of water in the food. A gradual return to a diet with only moderate salt and protein restriction, and more calories, is instituted later, and finally a normal diet for the patient in whom the condition is cured or arrested. A warm bath is usually given daily and occasionally hot packs in the severe cases. The bowels should move daily and it may be necessary to use a mild laxative or warm enemas or both. In some cases an occasional saline purge is advisable.

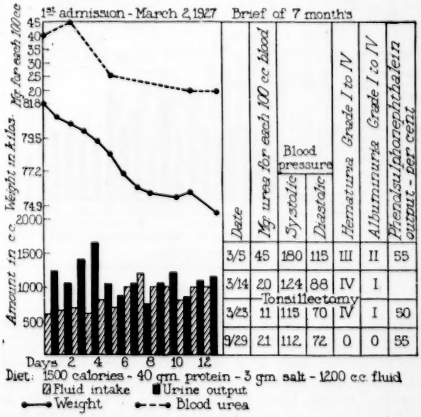

Chart 1.—Acute glomerulonephritis with edema (two weeks' history following tonsillitis) in a man, aged 35.

Diuretics are rarely needed in the acute stage. Sometimes a little later, if the foregoing measures are not sufficient, drugs of the xanthine group may be used in moderate doses for short periods. Of this group we prefer theophylline-ethylenediamine [5] in doses of 0.2 Gm. three or four times daily. Venesection alone or venesection followed by one or more injections of hypertonic solutions intravenously (500 cc. of 20 per cent dextrose) has been used in a few cases with benefit

3. Epstein, A. A.: Concerning the Causation of Edema in Chronic Parenchymatous Nephritis: Method for Its Alleviation, Am. J. M. Sc. **154**: 638-647 (Nov.) 1917; Further Observation on the Nature and Treatment of Chronic Nephrosis, ibid. **163**: 167-186 (Feb.) 1922.

4. Keith, N. M.; Smith, F. H., and Whelan, Mary: The Therapeutic Use of Diets Low in Water and Mineral Content, Arch. Int. Med. **37**: 550-558 (April) 1926.

5. This drug is sold under the trade name of Euphyllin. It has not been accepted by the Council of Pharmacy and Chemistry of the American Medical Association. The Council has informed the distributor that it will be accepted if the advertising claims are made acceptable and the claimed composition is confirmed.

when oliguria was severe and prolonged. Occasionally we have used the acid producing salts (ammonium chloride, ammonium nitrate, and calcium chloride) successfully. Decapsulation of the kidneys should always be kept in mind, and in properly selected cases of profound oliguria and acutely swollen kidneys it may be a life-saving measure. This procedure was first advocated by Harrison [6] in 1896. Definite foci of infection should be eradicated preferably after the acute process has subsided. But occasionally when a focus shows active infection, and the hematuria is profuse early removal of the focus is indicated. The tonsils and accessory nasal sinuses are the most frequent offenders, followed by the teeth and prostate and, rarely, by the pelvis in the female.

The special symptoms that often require consideration are oliguria, or even anuria, and convulsions. The first of these we have discussed. Several measures must be considered in the treatment of convulsions: sedative drugs, posture, venesection alone or venesection followed by hypertonic solutions intravenously and lumbar

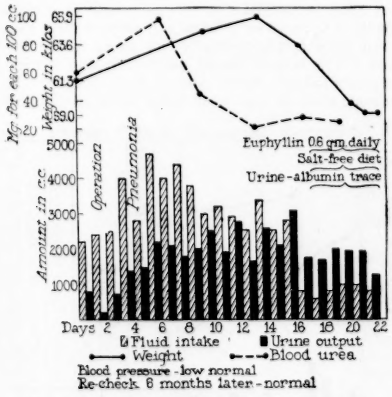

Chart 2.—Acute toxic renal insufficiency in a man, aged 70.

puncture. In our experience the sedative drugs in the order of their importance are morphine, chloral hydrate, phenobarbital and, as a last resort, ether. As many attempts are directed toward the reduction of possible cerebral edema, these patients should be propped up in bed with the head well elevated. We have seen a few cases of severe edema in which we felt that the convulsions were initiated by the patient lying in the prone position. Venesection of from 300 to 500 cc. when possible followed by the injection of a similar amount of 20 to 30 per cent dextrose solution is often of definite value. Lumbar puncture will sometimes prevent recurrence of the convulsions. This is true even though the pressure of the cerebral spinal fluid is not appreciably increased.

Acute Renal Insufficiency.[7]—When edema occurs, it is often the result of high and prolonged fluid intake in an effort to overcome oliguria. Usually the first indications of acute renal insufficiency are oliguria and a corresponding elevation of blood urea (sometimes to more than 100 mg. for each 100 cc.). Slight to moderate albuminuria is present but hematuria, hypertension or other signs of acute diffuse glomerulonephritis are absent. Occasionally, however, the foregoing picture is accompanied by edema. A study of the records usually shows evidence of a prolonged high fluid intake, much of which is in the form of physiologic solution of sodium chloride.

The treatment indicated is reduction of salt, water and protein intake. This usually readily controls the edema and azotemia unless the primary cause of the renal insufficiency is steadily progressive (for example, peritonitis and pneumonia) in which case it may be impossible to alter the excretion of the kidney. We have found diuretics of the xanthine group to be of distinct value in increasing urinary excretion in this condition. Again, we prefer theophylline ethylenediamine in oral doses of 0.2 Gm. from three to five times a day. If the drug cannot be administered by mouth it may be given rectally or subcutaneously. The prognosis as far as recovery from the renal condition alone is concerned is good, definitely better than in acute diffuse glomerulonephritis (chart 2).

Subacute or Chronic Glomerulonephritis.—The treatment of patients with subacute or chronic glomerulonephritis with edema as a rule presents the most difficult problems encountered in the treatment of nephritic edema. Not only is the ultimate prognosis decidedly more grave in this group (table 1), but the immediate course may be more difficult to control because of the frequent association of edema with nitrogen retention and hematuria. Rest in bed is advisable during the severe stage when edema or uremia is present. Later, as the patient improves temporarily, he should be allowed to get up; the same care should be taken as in the acute cases that the patient keep warm and avoid exertion.

The diet should be restricted in salt, water and protein, and should be ample in calories. The amount of restriction of water and protein advisable is determined largely by balancing the amount of edema against the amount of nitrogen retention. A suitable adjustment can usually be made if one keeps in mind the general principle that edema demands fluid and salt restriction whereas nitrogen retention demands protein restriction and free fluid intake. Thus, if in a given case there is marked edema and little if any nitrogen retention, the fluids should be very much restricted and the protein slightly so. The patient should have sufficient protein at least to maintain nitrogen equilibrium, whereas, if there is evidence of considerable nitrogen retention, the protein in the diet should be more rigidly restricted and the fluid allowance slightly increased. The diets advocated by Keith, Smith and Whelan [4] are suitable, being low in water and salt. Extra fluid can then be added as seems necessary. The amount of protein allowed is usually from 40 to 60 Gm. daily. Condiments and extracts, alcohol, tea and coffe, should be avoided.

Diuretics are usually indicated and are selected according to the clinical data available. In the absence of nitrogen retention in the blood, ammonium chloride [8]

6. Harrison, Reginald: A Contribution to the Study of Some Forms of Albuminuria Associated with Kidney Tension and Their Treatment, Lancet **1**: 18-20, 1896.

7. Bannick, E. G., and Keith, N. M.: Acute Renal Insufficiency Following Operation for Carcinoma of Sigmoid and Rectum, M. Clin. North America **11**: 1571-1581, 1928. Barrier, C. W., and Keith, N. M.: Acute Renal Insufficiency Following Major Surgical Operations, ibid. **7**: 135-140 (July) 1923.

8. Keith, N. M.: Barrier, C. W., and Whelan, Mary: The Diuretic Action of Ammonium Chlorid and Novarsurol in Cases of Nephritis with Edema, J. A. M. A. **85**: 799-806 (Sept. 12) 1925.

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and ammonium nitrate[9] usually will cause definitely increased elimination of salt and water. These drugs are given by mouth in doses of from 5 to 10 Gm. daily and can be administered over a prolonged period with benefit. Since these salts cause an increase of urea and a decrease in the alkali reserve, determinations of the blood urea and the carbon dioxide combining power of the plasma should be made periodically during their administration. We have given as much as 515 Gm. of ammonium chloride to a patient in sixty-nine days (table 2), and 580 Gm. of ammonium nitrate and 150 Gm. of ammonium chloride to another patient with polyserositis in seventy-eight days without untoward effect. If given in enteric coated pills they do not as a rule cause nausea or vomiting, and are usually satisfactorily absorbed. In a few cases, however, especially in which there is severe edema and ascites, we have noted failure of complete absorption. Under these conditions the drug should be administered in solution and in a suitable vehicle such as peppermint water (from 12.5 to 25 per cent solution).

times, and if there is hematuria or considerable retention of nitrogen they should not, as a rule, be used. Calcium chloride is another efficient diuretic in nephritic edema, as was conclusively proved by Schultz,[11] and later by others.[12] It is not so well tolerated by the patient as ammonium chloride and ammonium nitrate, nor as efficient a diuretic, and the latter are usually preferred when they are not contraindicated. Calcium chloride, on the other hand, is less likely to cause an increase in the blood urea in cases in which the urea was elevated before the institution of treatment. In this type of case it is often of definite therapeutic value. The daily dose is from 5 to 10 Gm. Xanthine diuretics may be of value in many cases of nephritis with edema, but the diuresis is not as marked or as uniform as after the combined use of acid-forming salts and organic mercury compounds. We have used them chiefly when there was definite nitrogen retention and the ammonium salts and organic mercury compounds were contraindicated. In several such cases the diuresis was marked (chart 3). Of the xanthine prep-

TABLE 2.—*Arrested Subacute or Chronic Glomerulonephritis in a Man, Aged Thirty-Two* *

Date	Time Since Onset, Months	Weight, Kg.	Edema, Grade	Blood Pressure: Systolic	Blood Pressure: Diastolic	Blood: Hemoglobin, per Cent (Dare)	Blood: Erythrocytes, Millions	Blood: Urea, Mg. per 100 Cc.	Blood: Creatinine, Mg. per 100 Cc.	Blood: Cholesterol, Mg. per 100 Cc.	Blood: Serum Protein, Gm. per 100 Cc.	Urine: Albumin, Grade	Urine: Casts, Grade	Urine: Phenolsulphonphthalein, per Cent	Comment
10/26/25	5.5	81.4	4	165	120	45	3.20	63	1.5	286	4.7	3	4	25	History of abdominal paracentesis eleven times since onset
11/13/25	6.0	69.7	3	130	90	50	....	32	...	...	...	3	2	40	Loss of weight, 14.7 Kg. in eighteen days; ammonium chloride, 81 Gm.; salyrgan, 6.5 cc. (four injections)
11/27/25	6.5	72.6	3	135	90	..	....	51	...	...	...	3	4	..	Gain in weight, 3.1 Kg. in thirteen days; ammonium chloride, 105 Gm.; salyrgan, 6.0 cc. (three injections)
12/31/25	...	.....	.	....	....	..	....	..	...	...	...	.	.	..	Transfusion, 500 cc.
1/ 2/26	7.5	57.0	.	110	80	60	3.64	43	1.1	177	...	3	3	..	Loss of weight since admission, 27.4 Kg.; ammonium chloride since admission, 515 Gm.; salyrgan since admission, 30 cc. (sixteen injections); diet since admission, low salt, low fluid type; maximal twenty-four hour output of urine, 5,100 cc.; dismissed; only occasional erythrocytes in urine
6/ 8/26	12.0	70.0	.	120	75	72	5.04	38	1.6	101	...	1	.	60	Healthy; adhered strictly to low salt, low fluid diet and ammonium chloride, 6 Gm. daily (alternate weeks)
6/10/27	25.0	71.0	.	125	75	73	4.55	34	1.6	...	...	1	.	80	Healthy; diet general except for qualitative salt restriction
5/25/28	37.0	70.0	.	125	80	80	5.20	38	...	139	6.5	Trace	.	75	Healthy; retinitis not present during illness

* Results show first successful preliminary diuresis, then a period with little diuretic response and finally a period of marked diuresis. Course exceptionally favorable.

In cases in which there is considerable retention of urea the drugs are not given because of the tendency further to elevate the blood urea and to cause acidosis. We have noted six cases in which severe acidosis developed after ammonium chloride had been given. In several of these the carbon dioxide combining power of the plasma was decreased to 20 per cent by volume, but all the patients recovered on the withdrawal of the drug and the occasional use of alkalis. We have not observed acidosis from treatment by ammonium nitrate which required discontinuance of the drug. For this reason and because it is better tolerated and acts more rapidly as a diuretic it is preferred to ammonium chloride. It is worthy of note that Thomas Willis,[10] 250 years ago, recommended "salt of nitre" as an efficient diuretic. In certain selected cases of subacute or chronic glomerulonephritis, organic mercury compounds have been used in conjunction with the ammonium salts with good results[8] (table 2). These compounds should be cautiously administered at all

arations theophylline and theophyllin-ethylenediamine are the most satisfactory diuretics and, of the two, the latter is much more soluble; it is less likely to cause nausea and seems to give the best results. The daily oral dosage is from 0.6 to 1 Gm. It may also be given by rectum and subcutaneously. In one case (chart 3), 29.7 Gm. of theophyllin-ethylenediamine was given in thirty-seven days without toxic effects or any discomfort to the patient. As a rule, however, the xanthine diuretics should be administered for shorter periods and repeated if necessary.

Osman[13] summarized his experience with the use of alkalis in the treatment of nephritis. He concluded: "Cases of nephritis with edema and cases in which the urinary volume is below normal are

9. Jacobs, M. F., and Keith, N. M.: The Use of Diuretics in Cardiac Edema, M. Clin. North America **10**: 605-610 (Nov.) 1926.

10. Willis, Thomas: Pharmaceutice Rationalis, London, T. Dring, C. Harper and J. Leigh, 1679, p. 74.

11. Schultz, Erich: Klinische Beobachtungen über Nierenentzündung bei Kriegsteilnehmer, Ztschr. f. klin. Med. **86**: 111-138, 1918.

12. Atchley, D. W.; Loeb, R. F., and Benedict, E. M.: Physiochemical Studies of Calcium Chlorid Diuresis, J. A. M. A. **86**: 1643-1644 (June 2) 1923. Rockwood, Reed; and Barrier, C. W.: Calcium Treatment for Edema, Arch. Int. Med. **32**: 643-657 (May) 1924. Blum, L.; Aubel, E., and Hausknecht, R.: L'action diurétique des sels de calcium dans la néphrite avec oedemes, Bull. et mém. Soc. méd. d. hôp. de Paris **46**: 206-214 (Feb. 3) 1922.

13. Osman, A. A.: Studies in Bright's Disease: Use of Alkalis in Treatment of Bright's Disease, Guy's Hosp. Rep. **77**: 386-435 (July-Oct.) 1927.

likely to derive benefit by giving alkalis in amounts sufficient to raise the plasma bicarbonate to a normal level and to maintain it at this point." He noted the most striking results in chronic nephritis with edema and subacute nephritis. He gave very large doses. Several adults were maintained on a daily dosage of 73 Gm. of his alkaline compounds, and one child of 4 received 92 Gm. in twenty-four hours. Osman emphasized the necessity of large doses, and that there is often an initial stage of increased edema before diuresis takes place. He concluded: "There is reason to believe that inadequate dosage is not only unsuccessful but probably harmful." Tetany, of course, constitutes one of the dangers of this treatment, and vomiting and diarrhea are encountered. Thus it is interesting to note that diuresis may occur either following the use of large doses of alkalis or following the use of acid-forming salts, such as we have mentioned. We much prefer to use the latter because diuresis is more rapid, more striking and more constant, and since the adequate dosage is much smaller there is less danger of toxic manifestations, and the administration of the drug is simpler and better tolerated by the patient. Urea may be used as a diuretic, but we believe that ammonium chloride and ammonium nitrate are far more suitable and efficient, and may be used in any case in which urea therapy is indicated. If there is evidence of complicating myocardial failure, the use of digitalis should be considered.

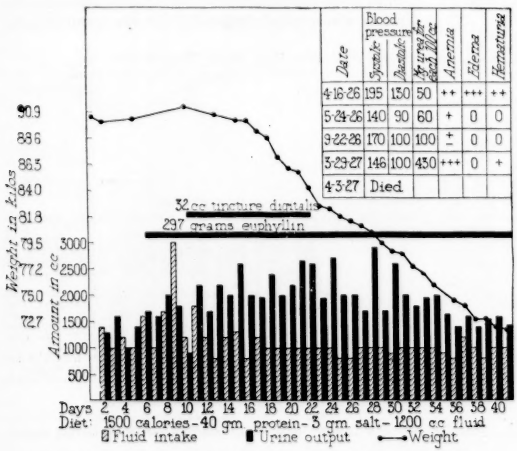

Chart 3.—Six months' history of "Bright's disease" with edema in a man, aged 49.

All definite foci of infection should be eradicated if the general condition of the patient and his ultimate expectancy warrant it. Good judgment is often vital in such cases, since a severe exacerbation of the disease may be produced by the untimely removal of foci which may have been mild or even a questionable source of infection.

A daily bowel movement is usually accomplished by the use of a suitable diet. Sometimes the addition of agar-agar or liquid petrolatum, or even a mild laxative, is advisable. Purging is rarely indicated. A warm bath should be given daily, especially in cases in which there are hypertension and headaches. Hot packs are rarely of sufficient benefit to justify their use. A warm, dry, equable climate is preferable unless contraindicated by economic factors. The complications, such as oliguria, uremia and convulsions, should in general be treated in the same manner as in acute diffuse glomerulonephritis.

Chronic Nephrosis.—The treatment of this condition is similar in many respects to the treatment outlined for subacute and chronic glomerulonephritis with edema, since many symptoms are the same. Yet the distinguishing features of these disorders account for the difference in prognosis (table 1) and need special therapeutic consideration.

Epstein [3] has advised a diet high in protein and low in fat in chronic nephrosis. He and many others maintain that good results follow its use. Others have been unable to duplicate his results. Epstein's diets provide daily from 1,280 to 2,500 calories, from 120 to 140 Gm. of protein, from 20 to 40 Gm. of fat, and from 150 to 300 Gm. of carbohydrate. He allows from 1,200 to 1,500 cc. of additional fluid and salt in sufficient quantity to make the food palatable. One of us (Keith [4]) has previously recommended diets low in water and mineral content in cases of nephrosis as well as in other cases in which edema is marked. These diets have been satisfactory in the cases of nephrosis in this series (table 1), although the good results are not attributed solely to the diet. Suitable and efficient diuretics as well as removal of foci of infection and avoidance of exposure have played an important part. Most of the patients are doing very well, many are free from symptoms, except slight albuminuria; at least two patients apparently are entirely cured. In all of the cases in which patients have been free from symptoms for a considerable period the concentration of lipoids and protein in the blood is practically normal. This is noteworthy because these patients had not been on high protein or low fat diets. In fact, some of them had been on low protein diets, lower than we are using at present. We wish to point out that the dietary treatment of chronic nephrosis does not end with a consideration of the high protein and low fat type of diet. Many patients recover splendidly when these factors have been ignored. Restriction of salt and water play an important part in controlling the edema, which is the chief symptom which disables the patients and retards their recovery. Our experience has been in accord with Linder, Lundsgaard and Van Slyke,[14] and with Fahr and Swanson [15] in concluding that reduction in the concentration of protein in the plasma is not the chief factor in the production and persistence of the edema. We also have observed cases in which spontaneous diuresis occurred without change in the low plasma protein concentration.

On the other hand, since in chronic nephrosis there is little tendency to retention of the end-products of protein metabolism and since the plasma proteins are consistently low and there is loss of albumin in the urine, there is little if any need of protein restriction. A liberal allowance of protein makes a more normal diet

14. Linder, G. C.; Lundsgaard, C., and Van Slyke, D. D.: The Concentration of the Plasma Proteins in Nephritis, J. Exper. Med. **39**: 887-920 (June) 1924.

15. Fahr, George; and Swanson, W. W.: The Quantities of Serum Albumin, Globulin and Fibrinogen in Blood Plasma in Acute and Chronic nephropathies, Arch. Int. Med. **38**: 510-526 (Dec.) 1926.

and should be of benefit to the patient. Consequently, we now endeavor to allow sufficient protein to keep the patient in positive nitrogen balance and an additional 10 to 20 Gm. daily that may be available for storage. If plenty of calories are supplied, 1 Gm. of protein for each kilogram of normal body weight is usually sufficient to insure a positive nitrogen balance in adults in spite of considerable albuminuria, and this, with an additional 10 to 20 Gm., brings the total daily protein up to from 80 to 90 Gm. It may be best to give children more than 1 Gm. for each kilogram of body weight. These principles are similar to those laid down by Peters;[16] like him we are unwilling to advocate high protein diets. Berglund and Medes[17] believe that such diets increase albuminuria, and the experimental work of Newburgh and Marsh[18] suggests the possibility that they are not entirely harmless.

The question of rigid reduction of fat in the diet we consider of minor importance. Several observers agree that such restriction alone has little effect on the lipoid concentration of the blood in nephrosis or on the course of the disease. We have not deemed it necessary to restrict the fats beyond the limits of a normal diet. Table 3 gives a comparison of the original low salt, low fluid diet of Keith, Smith and Whelan, and the more recent modification for use in cases of the nephrosis type. Later when the patient remains free from edema the restriction on salt and water is gradually lessened until the diet is in fact normal.

Diuretics are indicated in chronic nephrosis because of marked and often massive edema. Various diuretics have been considered in discussing the treatment of subacute and chronic glomerulonephritis. Any of these may be used in treating chronic nephrosis, since there are fewer contraindicating factors. Ammonium chloride and ammonium nitrate are preferable for reasons previously stated and are given as outlined. If the response to ammonium chloride or ammonium nitrate is not satisfactory or if the edema is so severe as to demand more energetic treatment, the additional use of organic mercury compounds markedly increases the diuresis. Chart 4 is a splendid example of the combined action of ammonium chloride and organic mercury compounds in chronic nephrosis and carefully selected cases of subacute or chronic glomerulonephritis with marked and lasting benefit and without untoward effects. These cases and others answer the question as to the advisability of using organic mercury compounds in the presence of renal lesions. After an initial test dose of 0.5 cc. these compounds may be given in doses of 2 cc. every four to five days, if necessary, preferably intravenously, but they may also be given intramuscularly. When the latter route is chosen they should be given deeply into the muscle and not subcutaneously because of the lack of proper absorption and the possibility of the formation of a sloughing wound. The occasional toxic effects, such as gingivitis and diarrhea, have never been serious in our experience with these drugs. Marriott[19] recommends the xanthine diuretics in the treatment of chronic nephrosis in children; they should be given a trial in cases of adults also if the diuretics previously mentioned fail. The use of thyroid in the treatment of chronic nephrosis was first introduced by Eppinger.[20] He used it in various forms of edema but obtained the best results in cases of chronic nephrosis or in the mixed type of nephritis and nephrosis. The desired effect was not obtained in every case. More recently Epstein[21] has advocated thyroid in chronic nephrosis. The initial dose is small, from 0.1 to 0.2 Gm. Unless he obtains a satisfactory effect the dosage is rapidly increased up to 2 Gm. a day, and if this too is insufficient, he advises thyroxin intravenously in doses of from 5 to 10 mg. In our cases thyroid has not produced the consistent, rapid and striking diuretic results that have been obtained with ammonium chloride, or ammonium nitrate, and organic mercury compounds. Consequently thyroid is now being used in smaller doses and only in cases in which the basal metabolism remains definitely lowered after the edema has disappeared.

The removal of foci of infection is important. As in acute glomerulonephritis, when a definitely infectious

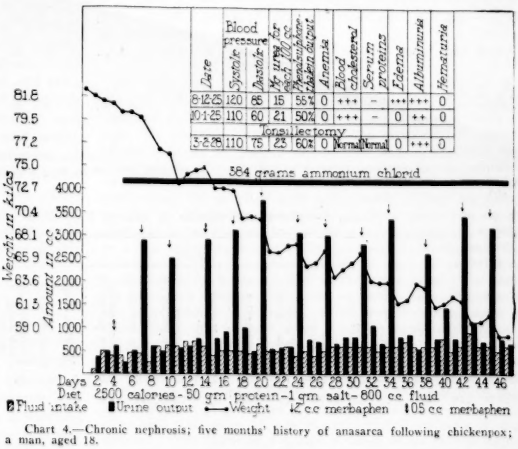

Chart 4.—Chronic nephrosis; five months' history of anasarca following chickenpox; a man, aged 18.

TABLE 3.—*Composition of Low Salt, Low Fluid Diets* *

Type	Carbohydrate, Gm.	Protein, Gm.	Fat, Gm.	Calories	Water, Cc.	Sodium, Gm.	Chlorine, Gm.
Basal, "salt-free"	190	40	65	1,500	1,300	1.15	1.60
1	130	40	80	1,500	800	0.50	0.70
2	235	50	145	2,500	900	0.77	0.88
3	300	60	120	2,500	930	0.70	0.90
4	350	70	85	2,500	850	0.68	0.85
5	345	80	90	2,500	930	0.67	0.75
6	320	90	95	2,500	860	0.65	0.78
7	275	100	110	2,500	920	0.75	0.80

* Compiled by Miss F. H. Smith.

pounds. Table 2 and chart 4 illustrate the fact that frequent injections of organic mercury compounds may

16. Peters, J. P.: The Principles of Diet Control in Nephritis, with Especial Reference to Protein and Salt Restriction, J. Am. Dietetic A. **2**: 137-146, 1926-1927.

17. Berglund, Hilding; and Medes, Grace: Induced Large Variations in Urinary Proteins in Bright's Disease, Particularly in Nephrosis, Proc. Soc. Exper. Biol. & Med. **24**: 528-529, 1926-1927.

18. Newburgh, L. H., and Marsh, P. L.: Renal Injuries by Amino-Acids, Arch. Int. Med. **36**: 682-711 (Nov.) 1925.

19. Marriott, McKim: Nephritis: Newer Viewpoints Concerning Its Nature and Treatment, Northwest Med. **24**: 472-479 (Oct.) 1925.

20. Eppinger, Hans: Zur Pathologie und Therapie des menschlichen Oedems, Berlin, J. Springer, 1917.

21. Epstein, A. A.: Thyroid Therapy and Thyroid Tolerance in Chronic Nephrosis, J. A. M. A. **87**: 913-918 (Sept. 18) 1926.

focus causes persistent hematuria and other symptoms of the disease, so, in chronic nephrosis, there is often a significant relationship between the persistence or recurrence of edema and other symptoms of chronic nephrosis and the presence of definite foci of infection. Marriott has also been impressed with this fact and has emphasized the significance of infection in the accessory nasal sinuses in children with chronic nephrosis. Furthermore, if all foci of infection are eradicated and the edema is controlled, the patient is better able to build up his resistance and is less likely to contract upper respiratory infections or other infections that may result fatally. As in cases of glomerulonephritis, a warm equable climate is the most suitable.

Chronic Nephrosis of the Mixed Type.—Such cases may usually be treated in the same way as the uncomplicated types of chronic nephrosis (table 4). The other diseases with which the nephrosis is associated should be kept in mind constantly, however, since indications or contraindications for various therapeutic measures are more likely to arise and necessitate a deviation from the usual method of procedure (table 5). This is particularly true when the nephrosis is combined with glomerulonephritis.

TABLE 4.—*Chronic Nephrosis of Mixed Type in a Woman, Aged Forty-Three* *

Date	Time Since Onset, Months	Weight, Kg.	Edema, Grade	Blood Pressure: Systolic	Blood Pressure: Diastolic	Blood: Hemoglobin, per Cent (Dare)	Blood: Erythrocytes, Millions	Blood: Urea, Mg. per 100 Cc.	Blood: Creatinine, Mg. per 100 Cc.	Blood: Cholesterol, Mg. per 100 Cc.	Blood: Serum Protein, Gm. per 100 Cc.	Urine: Albumin, Grade	Urine: Casts, Grade	Urine: Phenolsulphonphthalein, per Cent	Comment
4/ 6/11	....	....	.	...	...	..	....	..	...	...	...	Trace	.	..	Tuberculous lymph node of neck removed; history of nephritis at 17
11/29/13	....	....	.	145	115	..	....	..	...	...	...	Trace	.	..	Headaches; slight edema of feet
9/ 4/14	....	....	.	125	...	..	....	..	...	...	...	.	.	..	Tonsillectomy
4/26/27	11.0	65.9	3	180	110	70	4.68	16	1.3	277	5.1	4	2	60	History of periodic edema for eleven months; basal metabolic rate, +13; heart normal in size and action; peripheral sclerosis graded 1 to 2
5/17/27	11.5	53.2	.	110	75	74	4.80	60	1.4	...	...	2	1	60	Loss in weight, 12.7 Kg. in twenty-one days; low salt, low fluid diet; ammonium nitrate, 132 Gm.; salyrgan, 6.5 cc. (four injections); maximal twenty-four hour output of urine, 2,500 cc.
5/31/27	12.0	53.2	.	100	70	..	....	40	2.0	...	...	1	.	..	Dismissed
3/31/28	22.0	52.0	.	120	85	72	4.61	28	...	134	6.2	3	2	75	Healthy; no retinitis since first observed; never more than an occasional red blood cell in urine; diet (strictly followed), 2,500 calories, 50 Gm. protein, low salt, low fluid

* Chronic nephrosis predominated in this case, but atypical because of long history of renal involvement with periodic hypertension. Good diuretic response and subsequent course.

TABLE 5.—*Chronic Nephrosis of Mixed Type in a Man, Aged Twenty-Three* *

Date	Time Since Onset, Months	Weight, Kg.	Edema, Grade	Blood Pressure: Systolic	Blood Pressure: Diastolic	Blood: Hemoglobin, per Cent (Dare)	Blood: Erythrocytes, Millions	Blood: Urea, Mg. per 100 Cc.	Blood: Creatinine, Mg. per 100 Cc.	Blood: Cholesterol, Mg. per 100 Cc.	Blood: Serum Protein, Gm. per 100 Cc.	Urine: Albumin, Grade	Urine: Casts, Grade	Urine: Phenolsulphonphthalein, per Cent	Comment
9/30/26	9.0	83.5	3	150	100	68	3.67	12	1.2	401	4.0	3	2	55	Ichthyosis-like dermatitis for four years; edema for nine months; basal metabolic rate, +2
10/25/26	10.0	64.0	.	130	98	70	3.60	12	1.5	447	3.9	2	.	..	Loss of weight, 19.5 Kg. in one month; low salt, low fluid diet; ammonium chloride, 120 Gm.; merbaphen, 9 cc. (five injections); maximal twenty-four hour output of urine, 3,700 cc.; sent home on 2,500 calories, 95 Gm. protein, 47 Gm. fat diet; adhered to diet poorly
3/ 4/27	14.0	79.0	3	150	120	68	3.22	27	...	362	...	3	3	45	Basal metabolic rate, −11 to −19; a few small retinal hemorrhages
3/16/27	14.5	76.8	3	150	105	..	....	33	...	...	...	4	4	..	Loss of weight, 2.2 Kg. (five days); low salt, low fluid diet; ammonium nitrate, 59 Gm.; salyrgan, 2 cc. (one injection)
3/28/27	15.0	76.6	3	135	90	..	....	37	...	...	...	4	3	..	Thyroxin, 7 mg., given intravenously; basal metabolic rate, −11
3/31/27	....	75.8	3	140	95	..	....	35	...	...	...	.	.	..	Basal metabolic rate, +7
4/ 5/27	....	....	.	...	...	40	2.71	56	...	...	...	4	3	..	Bronchopneumonia; placed in oxygen chamber; retina clear
4/10/27	....	....	.	...	...	..	....	..	...	...	...				Left empyema; hemolytic streptococcus
4/13/27	....	....	.	...	...	..	....	..	...	...	...	.	.	..	Right empyema; hemolytic streptococcus; right parotitis
4/22/27	....	....	.	115	70	58	2.15	61	...	...	...	.	.	..	Removed from oxygen chamber
5/ 3/27	....	....	.	...	...	..	....	188	4.2	...	...	4	.	..	
5/ 6/27	....	....	.	...	...	..	....	188	4.3	...	...	4	.	..	Placed in oxygen chamber
5/ 8/27	16.0	....	.	...	...	..	....	..	...	...	...	.	.	..	Died; repeated chest aspiration since onset of double empyema; never more than an occasional red blood cell in urine; necropsy: large pale smooth kidneys; combined weight, 660 Gm.; chiefly nephrosis; a few glomeruli showed evidence of previous inflammation; weight of heart, 340 Gm.

* Good diuretic response on first admission; subsequent recurrence of edema, patient unable to follow regimen outlined. Terminal renal insufficiency initiated by pulmonary infection. Necropsy revealed chiefly nephrosis.

COMMENT

The problem of renal edema involves two major factors, the condition of the kidney itself and the fluid-laden tissues throughout the body. Intensive study of cases of chronic nephrosis during the last few years has shown that striking metabolic disturbances may be present with limited renal pathologic change. On the other hand, in cases of glomerulonephritis with exten-

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sive edema, the renal lesion may be marked and the metabolic disorder present but not so pronounced. Our aim has been to employ therapeutic measures that would initiate the movement of the excessive amount of tissue fluid toward the blood so that ultimately it would be excreted chiefly by the kidney. Such an effect may often be produced quickly by different methods. The most satisfactory method in this group of cases was the combined use of a low salt, low fluid diet, and one or more of the various diuretics. The diet, besides being low in salt and water, should provide sufficient calories, and the amount of protein should be adjusted to meet the conditions present. When azotemia exists reduction to a daily intake of 40 Gm. of protein may be necessary, while in cases of nephrosis adequate but not excessive amounts are advisable. With certain reservations as to the cases selected, the best combination of diuretics has been ammonium nitrate and organic mercury compounds. Of the latter, salyrgan [22] has caused the most marked diuresis and shown the least toxic effects. The diuretic period varies from two to six weeks and the loss of fluid may amount to 80 pounds (36.4 Kg.). During this period there is often an immediate tendency to gain in weight subsequent to marked diuresis of twenty-four hours' duration. This tendency to retain fluid and salts after rapid fluid loss is an exaggeration of what occurs in the normal person under similar conditions, and emphasizes the important part the low salt and water intake may play in preventing rapid accumulation of fluid in resistant cases of edema. Elimination of the edema seems to benefit the whole organism and often permits the patients to live comfortable and normal lives. It also allows them to build up resistance to infections, which is so often serious in cases of nephritis and nephrosis.

After the patient is free from edema, the important question of future treatment must be considered. In each case the tolerance for water and salts must be gaged and if it is low the diet may have to be continued indefinitely; in resistant cases periodic prolonged use of one or more diuretics may also be necessary. One such patient with an extremely low tolerance for salt and water has followed strictly such a combined regimen for three years. She has remained practically free from edema and in good health. In the majority of cases the restricted diet and the occasional use of a single diuretic prevents recurrence of the edema. In several cases of marked edema, however, the edema was controlled when the treatment was first given and the patients have remained free from edema without special diet or other treatment. Foci of infection should be removed in acute nephritis, in subacute or chronic nephrosis, and in certain cases of subacute or chronic glomerulonephritis.

The importance of exact diagnosis and accurate grouping of the cases has been demonstrated repeatedly. In the presence of an acute renal lesion, recovery is often complete.[23] In most cases of chronic nephrosis the course of the disease can be arrested and the patient may enjoy comparatively good health. Death usually results from an infectious process rather than from renal insufficiency. In subacute or chronic glomerulonephritis, arrested cases do occur but these are few. Many cases run a progressively downward course and the most common cause of death is renal insufficiency. There is still much to learn with regard to the problems in renal disease. The demonstration of specific etiologic factors might lead to preventive and specific treatment. The knowledge obtained from more complete and accurate clinical, bacteriologic and pathologic data as to the nature and amount of injury produced in the case of nephritis by focal and intercurrent infections might prolong many lives indefinitely. Edema might even be prevented and we are sure more readily controlled, if the mechanism of its formation and resolution were more clearly understood.

22. This compound has not been accepted by the Council on Pharmacy and Chemistry of the American Medical Association because its chemical department has been unable to confirm the manufacturer's formula for its chemical composition.

23. Hume, W. E., and Nattrass, F. J.: Late Effects of War Nephritis, Quart. J. Med. **21**: 1-6 (Oct.) 1927.

SUMMARY

In a series of cases of nephritis and nephrosis with edema, treatment was instituted during the active stage of the disease. Subsequent periodic observations have shown that in many acute cases the patients recover, and that the prognosis in the more chronic cases is comparatively good in nephrosis, but serious in glomerulonephritis. The most satisfactory therapeutic measures were suitable diets, efficient diuretics, and the eradication of infectious foci.

ABSTRACT OF DISCUSSION

DR. HILDING BERGLUND, Minneapolis: The title of this paper is "The Treatment of Nephritis with Edema." It might therefore be correct to ask, Which is the important thing to treat, the nephritis in the kidney or the symptoms of edema? In the majority of cases it is the treatment of nephritis that is important. The majority of these patients do well whether we do anything or not. We are very often forced to discharge them from the hospital with albuminuria. They go home, promise to follow the instructions to keep warm and do no work, go out in the field and do their farming, and six months or a year later they are well. In the cases of chronic nephritis, if it is acute, it is a question whether to treat the nephritis or to determine the prognosis, and in the majority of these cases the edema is a symptom that is not very much in the foreground. We might just as well admit, as has been shown by some of these charts, that in these cases of chronic nephritis temporary relief of edema, with chronic nephritis in an advanced stage, can be obtained from a progressive course, and it recedes whether we do one thing or another. However, if the chronic nephritis is taken in the comparatively early stage, it is my belief that thoroughly investigating the possibilities of infective foci in most cases will slow down or stop the progressive character of that disease. Then there is a group of cases in which the edema actually is the chief consideration; namely, the cases usually termed nephrosis, in which the kidney function is good and remains so for a long time, and in which there is heavy albuminuria. In these cases there are periods in which there is marked and stubborn edema, and also periods without remission. However, these periods of edema may extend over a year or two years. It is very difficult to aid these patients during that time. Edema, in probably the majority of these cases, can be handled more successfully than formerly. In these patients, if one dares to use the acid producing salts without too much irritation to the kidneys, calcium sodium, or ammonium nitrate or ammonium chloride, one will help to free them from edema very frequently. The tendency to reestablish edema remains, but in many cases this tendency can be controlled with proper dietary measures, and we can make the patients more comfortable.

DR. NOEL F. SHAMBAUGH, Ann Arbor, Mich.: Those who have been concerned with the organic and inorganic salt metabolism of the animal body will appreciate and respect the delicately balanced mechanism by which the kidney conserves these salts when the necessity arises. It is with this conservation mechanism, as well as that of waste elimination, that we must deal in the consideration of diuresis. That diuresis holds an important place in therapeutics has been satisfactorily shown by the authors. Diuresis serves another significant purpose. Much has been learned of kidney physiology and the secretion of urine under normal circumstances by observations on the

activity of kidneys under the influence of diuretics. In this connection, one pressing unsolved question is the mechanism by which diuresis is promoted. We use therapeutically such widely divergent substances as calcium chloride, mercury salts, sodium sulphate, digitalis, pituitary extracts, the chloride and nitrate of ammonium, the purine derivatives and countless others. We, measure their efficacy by increases in fluid output. We are handicapped in evaluating our results, which are often negative or inconstant, by an unsound knowledge of the principles underlying these results. Curtis and I have shown that in diuresis with theophylline-ethylenediamine, the chlorides play an important rôle. We are able, by deviating the chloride supply of the body, not only to check diuresis but to inhibit almost completely the normal flow of urine in denervated animals. This interdependence between chloride and diuresis was noted by Keith and Whelan. This represents only one essential factor in the production of diuresis from one single drug. Pituitary extract causes an increase in urinary output without demonstrable vascular change; yet the complete picture is unknown. In the case of caffeine, Richards and Plant, and many others have shown that diuresis is not associated with changes in blood flow. Yet here, again, detailed knowledge of the entire process is lacking. Diuresis due to mercury is alleged to occur as a result of direct renal irritation. There is, on the other hand, evidence to show that this is not entirely true. These examples are briefly sketched to show our fragmentary knowledge of the problems with which we are here concerned. It is not unlikely that diuretic substances produce a common result through exercise of influences proper to each. This means that studies involving diuresis must combine accurate clinical observation with exhaustive laboratory investigation.

DR. H. O. MOSENTHAL, New York: There is one point I should like to make about our attitude toward the foci of infection in these cases. I believe it is important to know that it is possible to operate in nephritic cases without fear provided such cases are not in a terminal stage; operative procedures apparently do not do any harm. Thus far I have never seen any immediate beneficial effect on the existing nephritis. However, I believe as a prophylactic procedure the removal of infectious foci is distinctly indicated. We have had very good results in using urea as a diuretic. I do not mean that our results are invariably followed by success. However, as a diuretic the use of urea in large doses has been more successful than the use of other diuretics, and on this account I believe that the high protein diets do have some beneficial effect; a high protein diet increases the blood urea, which in turn stimulates the kidney to diuresis. In a certain number of cases in which the edema has been a troublesome therapeutic problem, we have found that large doses of thyroid, as much as 10 grains (0.65 Gm.) of thyroid extract per pound of body weight, would sometimes result in a diuresis and relief from the edema that could be accomplished in no other way. Of course, such doses of thyroid were initiated gradually and were reached only after a considerable period of clinical investigation and observation. I should like to ask the authors exactly what they mean by the term subacute nephritis.

DR. N. M. KEITH, Rochester, Minn.: Twenty or thirty pounds of edema fluid in a patient is unhealthy. We feel that with the methods outlined in our paper we can rid a good proportion, indeed a majority of these patients, of their edema, and by the continued use of such methods these patients can be kept edema-free. One of the facts that has not often been mentioned in regard to nephrosis is this: We have repeatedly seen patients return because they have had some intercurrent infection. Now in acute and chronic nephritis with an intercurrent infection, hematuria is one of the striking usual signs. In this nephrosis group infection often causes a recurrence of edema without hematuria. Therefore we feel that the removal of foci is extremely important. In regard to the question of subacute nephritis: When patients with a short history show a hypertension, that is, a systolic pressure above 140, and a diastolic about 90, and if they have also hematuria and possibly, but not always, urea retention, they are of the glomerular type. From our statistics it is quite evident that those cases run a much more serious course. We have had half a dozen cases which we thought at the beginning, in spite of a slight rise in blood pressure and slight hematuria, were nephrosis; subsequently the course was rapid and the patients went on to death in one to two years, no matter what we did for them, and in most instances they remained edema-free. Such an experience has made us realize the difficulty and importance of early differentiation between chronic glomerulonephritis and chronic nephrosis. In regard to Dr. Shambaugh's discussion as to the action of diuretics, he brought out many points which are of great interest and also important clinically. Curtis and he have shown that certain substances injected intraperitoneally have an inhibiting effect on caffeine diuresis. There is no doubt, I think, from their experimental studies and these studies in cases of nephritis and in other types of edema, such as in cirrhosis of the liver and cardiac decompensation, that there is a general tissue factor as well as a renal factor in the action of the diuretics. We have repeatedly seen patients with cirrhosis of the liver with marked ascites and normal renal response. Given this sort of treatment, such patients have passed the excessive fluid through the kidneys, which points to the conclusion that diuretics do have some general tissue action.

TUBERCULOUS ENTEROCOLITIS *

FRANK SMITHIES, M.D., Sc.D.
MORRIS WEISMAN, M.D.
AND
FRANK FREMMEL, M.D.
CHICAGO

Physicians supervising a large group of patients with pulmonary tuberculosis uniformly dread the appearance of dyspeptic symptoms. Their concern is deepest when the abdominal ailment exhibits itself as bowel malfunction. Clinical experience and operative and necropsy studies have demonstrated that the dyspepsia of those thoracically tuberculous quite commonly indicates abdominal, usually enteric, disease of like cause.

When this extension of tuberculosis occurs, the therapeutic problem presents aspects differing widely from those in which one deals only with a comparatively well localized lesion in the lungs. There are added to the needs for management of the pulmonary disturbance the control and treatment of lesions seriously affecting the patient from the standpoints of adequate feeding, relief of pain, nausea, vomiting, dehydrating and exhausting diarrhea, loss of sleep and rest, a peculiar systemic "intoxication" and the possibility of sudden accidents, as hemorrhage or perforation, and the complications incident to ascites, abscess or bowel obstruction. Often, indeed, it happens that the appearance enterically of a tuberculous lesion absolutely determines the prognosis: even those "mildly" phthisical, pulmonically, those who, in other circumstances, constitute a group for whom the outlook is encouraging, seem doomed to a relatively early death.

The purposes of this article are (*a*) to determine the frequency with which tuberculous enterocolitis occurs in a great group of subjects affected with tuberculous lesions extra-enterically; (*b*) to consider factors in the individual or the group which influence the initiation and the course of the intestinal disturbance; (*c*) to establish, so far as possible, certain clinical pictures indicative of the tuberculous lesion with respect to the part involved, the degree and the gravity; (*d*) to promulgate criteria whereby tuberculous enterocolitis can be recognized at a stage when it may prove curable, and (*e*) to suggest a method of management offering the most satisfactory outcome.

* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the authors' reprints.

* Read before the Section on Gastro-Enterology and Proctology at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 14, 1928.

SOURCE OF MATERIAL

The patients available for our clinical observation were resident at the Chicago Municipal Tuberculosis Sanitarium. This institution has a constant tuberculous population exceeding 1,000 patients; of this number, approximately 750 are sufficiently ill to be confined to the infirmary. The sanitarium differs from most institutions for the tuberculous in that it is in reality a hospital. It maintains well organized and adequately staffed departments such as one finds in any high-grade, general hospital. Further, the patients differ from those in the major number of sanatoriums for the tuberculous in that they constitute a constantly shifting population with known tuberculosis, replenished as vacancies by death or recovery occur from a group of more than 28,000 tuberculous persons who have been segregated from the inhabitants of the city through a system of adequate dispensaries.

Those who have experience in the handling of the tuberculous are familiar with certain of the common digestive upsets encountered. Many disturbances, frankly, are due to overfeeding or to the partaking of unsuitable food. Such dyspepsia would occur in any group of nontuberculous were their alimentary tracts subjected to like insults. This superalimentation commonly is followed by dyspepsia, evidenced by belching, pyrosis, occasional vomiting or gastric discomfort or by constipation or diarrhea. We emphasize these facts because it is important to differentiate "improper feeding dyspepsia" from the special form of alimentary tract upset which actually indicates, clinically, that a patient is beginning to exhibit dyspepsia as a result of tuberculosis of the digestive organs.

In order that we might have definite evidence of the incidence of digestive dysfunction among the sanitarium's population as a whole, we conducted a gastroenterologic survey. The survey questionnaire attempted to secure information regarding all forms of dyspepsia of such degree as to constitute a dietetic problem or to call for the exhibition of special therapeutic measures. Our survey, while yet incomplete, indicates that, of the total number of tuberculous inmates, 40 per cent experienced digestive irregularities sufficiently troublesome to warrant analysis. A summary of these symptomatic anomalies in the group is given in the accompanying table.

Summary of Symptomatic Anomalies

Dysphagia (laryngeal or tracheal disease?)	15%	
Gastric symptoms (nausea, vomiting, pyrosis)	40%	
Peptic ulcer syndrome	3.5%	
Disturbance in bowel function	79%	
(*a*) Constipation	39%	Of all dyspeptics
(*b*) Constipation alternating with diarrhea	21%	
(*c*) Constant diarrhea	19%	
(*d*) Stools exhibiting blood grossly	12%	
Normal stool frequency, but dyspepsia present	19%	

Thus, it is indicated that, of a large group of known tuberculous patients (proved to be so by clinical examinations, sputum analyses or complement fixation tests), approximately two of each five are in some degree dyspeptic, many, as will be shown, from enteric involvement.

For our present purposes, it becomes necessary to demonstrate in how many of this great group there exist evidences which enable us to consider that enterocolonic tuberculosis is present. Admittedly, this is a difficult task. Our problem differs from that commonly presented when tuberculous enterocolitis is discussed. In dealing with the disturbance, the majority of investigators (Lemon,[1] Carman,[2] Brown and Sampson[3]) have worked backward from pathologic material to clinical studies. They have had available necropsy specimens or laparotomy observations and, taking such as basic facts, have then analyzed, in the individual or the group, what were the clinical or laboratory accompaniments that preceded death or led to the decision to perform exploratory laparotomy. While such lines of endeavor return information of prime worth, the cases dealt with, almost uniformly, have been late or terminal. Hence, in most instances, the clinical descriptions of tuberculous enterocolitis that have become fixed in the literature are those common to widespread and hopelessly incurable stages of the ailment. The situation is in many respects comparable with the clinical or pathologic descriptions of gastric or enteric carcinoma that were accepted three decades ago: interesting enough, undoubtedly accurate, but prognostically and therapeutically distressing.

It would appear desirable that, earlier than when abdominal exploration is done as a "look-and-see," or when blocks of fixed tissue are at hand to prove an opinion, one should be in a position to detect the abdominal complication and direct management which offers hope of halting the tissue invasion or of bringing about cure. The question arises, Is it possible to establish dependable clinical criteria for the recognition of the early, as well as the advanced degrees of tuberculous enterocolitis, and if so, on what data can these diagnoses be made?

PATIENTS STUDIED

As representing the various forms of dyspepsia in the tuberculous in whom evidences of enteric tuberculosis were definite, we had a group of eighty patients available for intensive study.

In this group there were forty-four males and thirty-six females. The average age approximated 32 years; the youngest patient was 6, and the oldest 70 years. The average duration of the tuberculosis (usually, initially, pulmonary) was 2.6 years, the shortest duration being two months and the longest fourteen years. At the time of study, the sputum in forty-nine cases contained tubercle bacilli; in seventeen complement fixation tests were positive; in twelve the sputum was bacilli free, but in ten of these tubercle bacilli had been present in the sputum or positive complement fixation tests had been obtained. The two exceptions were instances of characteristic tuberculous bone lesions. In the entire group there was a family history of tuberculosis in twenty-three (28.7 per cent).

ALIMENTARY TRACT PHYSIOLOGIC FUNCTION AFFECTED BY TUBERCULOSIS

Before discussing the diagnostic criteria that have determined the segregation of our patients into three classes and commenting on the peculiar features common to each group, we wish to emphasize certain pathologic characteristics accompanying tuberculous enterocolitis. A review of this phase of the ailment has been made by Brown and Sampson.[4] Our remarks

1. Lemon, W. S.: Minnesota Med. **6**: 300 (May) 1923; **6**: 573 (Oct.) 1923.
2. Carman, R. D.: J. Radiol. **1**: 246 (April) 1920; Roentgenology of Tuberculous Enterocolitis, J. A. M. A. **74**: 1371 (May 15) 1920; The Roentgen Diagnosis of Disease of the Alimentary Tract, ed. 2, Philadelphia, W. B. Saunders Company, 1920.
3. Brown, Lawrason; and Sampson, H. L.: The Early Roentgen Diagnosis of Ulcerative Tuberculous Colitis, J. A. M. A. **73**: 77-85 (July 12) 1919.
4. Brown, Lawrason; and Sampson, H. L.: Intestinal Tuberculosis, Philadelphia, Lea & Febiger, 1926.

will be confined to such aspects of the disease as have not yet been emphasized sufficiently.

It is common knowledge that intra-abdominal tuberculous lesions rarely affect primarily the stomach and the proximal two thirds of the small bowel. In 95 per cent of instances the disease invades the terminal ileum, the cecum or the appendix, the ascending colon and the rectosigmoid. These portions of the intestine are segments associated with physiologic decrease in the rate of flow of the contents. Furthermore, normally there are differences in the physiologic function of the ileum and the large bowel. As small bowel contents approach the terminal ileum, the process of food absorption gradually diminishes and the progress rate changes. Through the function of the ileocecal valve, the powerful colonward push of the ileac contents is controlled. The contents of the small intestine then pass in a regular fashion into the cecum. Through the control of the neuromuscular mechanism at the ileocecal valve and in the cecum, the cecum is able, through its coordinated diastoles and systoles, to perform two functions: first, the equalization of the pressure push of the terminal ileum excited by the vigorous rate of contraction of the terminal ileum to the relatively lower intracecal pressure and, second, the initiation of the peculiar haustral and segmental mass motion of the colon.

In order that the symptoms arising from tuberculous invasion of the ileum, cecum and colon may be appreciated, it is essential that this normal physiologic mechanism be kept in mind.

In enterocolonic tuberculosis, whether it is constant (chronic or acute) or intermittent (chronic or acute), there is interference with normal neuromuscular mechanism. The modifications of the clinical aspects of interference with ileocecal function due to tuberculous disease, in contradistinction to nontuberculous disease, result because, in the tuberculous disease, one deals relatively rarely with small localized foci in either the ileum or the cecum, such as are commonly present in appendicitis, perityphlitis, typhoid, neoplasms and chronic ulcerative colitis.

Finally, though tuberculous enterocolitis manifests itself as a more or less limited disturbance of the terminal ileum, cecum and colon, during the progress of the ailment, destructive and reparative activities are simultaneously present, constantly or intermittently, locally or generally. These healing efforts, while conservative and protective, result in organic injury to the part involved: the accumulation of scar tissue interferes with normal neuromuscular function; scars may produce stenosis and deformity, and attempts at healing may cause erosion of great vessels, severe hemorrhage or even perforation. In no other ailment of the terminal ileum and the colon does one encounter this progression of events, and in no other type of involvement of these parts does one see, so closely associated with the pathologic advances and regressions, the clinical, physical and laboratory manifestations.

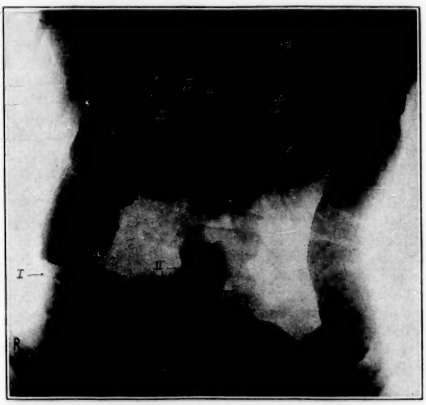

Fig. 1.—Typical appearance of tuberculous enterocolitis in patients in class 1. The barium enema reveals a normal colon with the exception of localized tuberculous infiltration with coincident cecal deformity at I; at II, early tuberculous lesions are seen in the terminal ileum. The tuberculous disease has interfered with the efficacy of the neuromuscular mechanism at the ileocecal valve, so that regurgitation into the terminal ileum seems constant and extensive.

LOCATION OF ENTERIC LESIONS

Investigative, experimental and pathologic data indicate that in approximately 60 per cent of instances, tuberculous enterocolitis begins as a relatively well localized disease. Commonly, this localization is in the appendix or in the cecum. Another form of local involvement results in the female from contiguous or peritoneal extension of tuberculous disease arising in the ovary and tube. Thus, it is evident that clinically, sometimes, it is possible to have the advantages, as regards cure, of a localized disease early in the course of the disturbance. This is of as great importance with respect to the prognosis in tuberculous enterocolitis as is the discovery of early, localized disease in instances of stomach or bowel cancer.

MODES AND ROUTES OF INFECTION

It is not our intention in this paper to discuss the pathways by which tuberculous invasion of the small and large bowel takes place. Experimental research has not yet offered conclusive information.

Evidence exists that, at times, enterocolitis follows the carrying of viable tubercle bacilli directly from a distal focus (usually thoracic) by way of the blood stream. In such instances, the lesions initially are apt to be multiple and diffuse, affecting both the ileum and the colon (probably similar to those in class 3, to be described later). In other patients, the opinion appears tenable that the bowel ailment arises only from the lymph stream (instances in which the terminal ileum early shows the greatest change). In the young and, perhaps, in the old, oftener than is recognized, when an open lesion exists in the lungs and tubercle bacilli are swallowed, experiments are available suggesting that the bowel infection (particularly of the cecum and the ascending colon) arises intra-enterically from contaminated residue. There are patients in whom localized tuberculous peritonitis and, later, enterocolitis follows tuberculous salpingitis, either contiguously or through the lymph stream.

ALLERGIC MANIFESTATIONS IN TUBERCULOUS ENTEROCOLITIS

The recent work of Duke,[5] Brown[6] and others calling attention to gastric and bowel ulcerative lesions arising as local, mucosal manifestations of allergy sup-

5. Duke, W. B.: Allergy, St. Louis, C. V. Mosby Company, 1925.
6. Brown, T. R.: Proc. Am. Gastro-Enterol. A., Washington, D. C., May, 1928, to be published.

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ports our opinion that, in certain patients with tuberculosis (active or quiescent) in parts of the body other than the bowel, allergy leads to the production of mucosal injury in the colon and the terminal ileum.

CLINICAL GROUPINGS

We introduced the foregoing remarks for the purpose of clarifying our clinical consideration of patients. Clinically, and from the standpoint of physical examination, the eighty cases grouped themselves into three classes.

Class 1 (seven cases): Mildly active or quiescent pulmonary tuberculosis accompanied by dyspeptic upsets which are, to these patients, entirely new experiences. The abdominal examination does not reveal striking physical anomalies.

Class 2 (forty-one cases): Active or quiescent pulmonary tuberculosis, accompanied by digestive upsets of varying duration, and in which abdominal examination reveals physical anomalies of mild degree, and frequently localized.

Class 3 (thirty-two cases): Pulmonary tuberculosis, commonly active, but occasionally quiescent, accompanied by pronounced digestive upsets, usually constant, and in which abdominal examination reveals physical anomalies of advanced degree and widespread.

CLINICAL SUMMARIES

Class 1: We would emphasize in this group of seven cases the following outstanding characteristics: (*a*) localized, rather slowly progressive tuberculous lesions, elsewhere than in the abdomen, existing for a number of years in a patient whose general resistance is fairly good; (*b*) previous to the onset of dyspeptic disturbance, either no digestive upsets whatever or a localized abdominal disease (appendix or fallopian tube) not considered tuberculous but furnishing a *locus minoris resistentiae,* at which local focus allergic phenomena were possible or direct implantation of tubercle bacilli from a distant site was probable; (*c*) absence of previous dyspepsia attributable to dietetic indiscretions, and, when the dyspeptic disturbances under consideration arose, lack of basis for ascribing them to any change in habits or dietetic regimen; (*d*) the absence of clinical symptoms and signs suggestive of extensive disease but rather the manifestations of mild, stimulative and irritative interference with normal neuromuscular function of the terminal ileum, ileocecal valve and cecum. On physical examination, localized disease was evidenced by slight local, muscle resistance, mild pressure pain, absence of diarrhea, bloody stools or tubercle bacilli in the stools, and lack of marked constitutional, toxic response. The roentgenologic evidence was indefinite. It is worth mentioning that, in this group, operations of appendicectomy and rectal fistula had been performed in three instances.

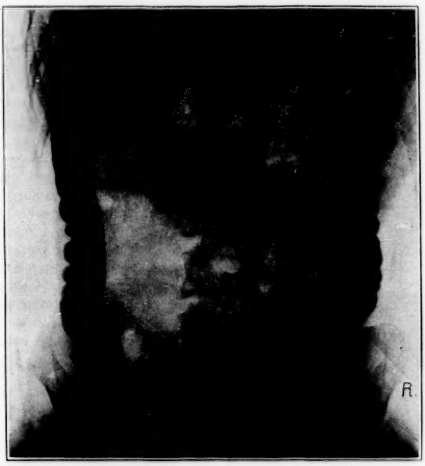

Fig. 2.—Appearance of colon in patient in class 1. By barium enema, the localized lesion (I) is seen involving only the sigmoid.

Class 2: The characteristics of the forty-one cases making up group 2 were as follows: constant or intermittently active pulmonary lesions of extensive degree; a period in which pulmonary lesions were unaccompanied by gastro-intestinal disturbances except of a mild, transient character, which period may extend over years; a terminal phase, during which there occurred a sudden flare-up of the thoracic lesion or the thoracic lesion remained quiescent but, as an entirely new occurrence in the course of the patient's disease, dyspeptic upsets appeared and remained constant. The dyspepsia was rarely annoyingly gastric; its manifestations usually were enteric, the enteric disturbance beginning commonly with intestinal stasis (constipation due to neuromuscular atony of toxic origin?). This was followed, at varying intervals, by more or less constant diarrheic stools or actual diarrhea (due to ileac and colon irritability as raw mucosal lesions became sufficient in number or extent to excite uncoordinated neuromuscular activity); the abdomen was rarely free from pain in consequence of local or general distention or movement of ulcerated segments of the ileum or colon; stools uniformly exhibited evidences of the destructive progression of ulcers, such as pus, blood, tissue bits and tubercle bacilli; dehydration, malnutrition and prostration were constant. Physical examination revealed abdominal distention; tenderness more particularly over the right lower abdominal quadrant or the course of the colon, but, at times, diffusely, particularly when there had been extension of the disease to the peritoneum, and the presence of small amounts of free peritoneal fluid. If the abdominal distention is not pronounced, thickening of the walls of the cecum and colon can be determined at palpation; occasionally actual tumor formations are recognizable, caused by localized thickness of the bowel or the omentum. Roentgenologic examination demonstrates actual deforming lesions commonly situated in the terminal ileum, the cecum or the colon.

In this group of patients, the enteric disease, while constant, was rarely acutely progressive. The destruction and healing, while extensive, proceeded in a somewhat leisurely fashion; the patient remained an invalid, frequently for several years, even though extensive enteric deformity might result. Death usually ensued from dehydration, starvation, hemorrhage, obstruction or, in rare instances, perforation.

The picture of tuberculous, ulcerative colitis strongly suggests allergy as an initial cause of the enteric injury, with the later invasion of the bowel by bacilli implanted

in the mucosa from bowel contents: i. e., the invasion is from the mucosa outward; mucosal defense is available, and simultaneous involvement and destruction of the numerous layers making up the bowel wall does not take place.

Of the forty-one patients in class 2, in periods ranging from one to seven years prior to the development of definite, tuberculous enterocolitis, eleven had had appendicectomy, five oophorectomy and two "tubal pregnancies." In seven patients of this group there were rectal fistulas and, in three, rectal abscess. Certainly, these observations suggest strongly that in these patients, thoracically tuberculous over a relatively long period of time, localized abdominal disease, in or contiguous to the bowel, existed for a considerable period prior to the later extensive ailment. The etiologic and prognostic significance of this observation needs no comment.

Fig. 3.—Appearance of colon (barium enema) of patient in class 2: I and II, moderately well localized but extensive spastic and obstructive tuberculous lesions in ascending and transverse colons and descending colon, respectively.

Class 3: The conditions common to the thirty-two patients making up class 3 were rapidly progressing pulmonary lesions, whose entire course was run within a year or less (very rarely more than three years). From the beginning, toxic manifestations were pronounced; the pulmonary spread of the infection seemed to meet comparatively feeble resistance and, when the bowels were attacked, there was likewise rapid invasion. Clinically, and at autopsy, the multiplicity of single or coalescent ulcers suggested a process similar to that found in miliary, tuberculous pulmonary disease. All layers of the walls of the intestine were simultaneously involved, and over wide areas from the mucosa to the peritoneum. Reparative efforts were feeble; scar tissue, with deformity, was rarely extensive, and death by hemorrhage, perforation or peritonitis occurred rapidly.

In the patients making up this class there was almost constant abdominal pain, aggravated when the bowels moved; diarrhea was nearly always present; stool frequency caused most profound exhaustion and dehydration, and the stools were laden with tubercle bacilli, pus, blood and undigested food. Often, anemia was marked and the urine exhibited albumin and casts. Rapid decrease in weight, loss of sleep and pain aggravated a most distressing picture. Physical examination of the abdomen disclosed, almost uniformly, distention of the large bowel, and a bloated abdominal contour imparting a peculiar, generalized "doughy" feel to the hand on palpation. Free peritoneal exudate complicated 40 per cent of the cases. Deep abdominal palpation was often impossible on account of distention but, when it was possible, the stiff indurated loops of bowel, not rarely enmeshed in the thickened omentum, were easily made out. Tenderness to palpation was frequently acute. When lesions were rapidly progressive, the danger of perforation from careless abdominal examination was great. Painful anal and rectal fissurations, hemorrhoids or local abscesses were present in nine instances. The appearance of rectal abscess seemed to carry with it an unusually grave prognosis, not alone from pain but apparently from the abscess furnishing a focus from which direct passage of bacteria into the blood stream was possible.

In class 3, the roentgenologic evidences of disease, whether the examinations were made by the means of progress meals or by barium enemas, always disclosed definite pathologic conditions. In these patients the roentgen examination must be carried out with great caution, particularly when barium enemas are used. So widespread are the destructive changes in the colon that the introduction of a large barium enema, under pressure, may be responsible for perforation, either from the distention of the intestine by the enema itself or from the inciting of vigorous, uncoordinated, peristaltic movements of the intestine in its efforts to free itself of the foreign body. Certainly, in this class of patients, roentgen examination often is contraindicated, just as it would be in other forms of acute, widespread ulcerative enterocolitis; e. g., acute enteritis and typhoid.

ROENTGEN STUDIES

A discussion of this topic would not be complete unless the value of the roentgenologic method of examination was mentioned. The excellent work of Brown and Sampson, Carman, and Emery and Monroe[7] has made available a procedure whereby one can at least determine from inferential or direct evidence whether or not a thoracically tuberculous individual is affected with an enterocolonic lesion. However, much work must yet be done in the interpretation of roentgenograms supposedly exhibiting pathologic conditions of the bowel. Particularly does this apply to roentgenograms made at spaced time intervals, as with the barium "progress meal." Our chief difficulty has been to establish in normal persons certain dependable criteria of normality and hence we are often in difficulties as to the interpretation of progress meals which purport to show the indirect evidence of early tuberculous enterocolitis. Further, it must be remembered that, if the roentgen method is to have a value greater than that of merely showing deformity or alterations of movement, presumably varying from the normal, it must return information definitely characteristic of early, localized and curable lesions.

Our roentgenograms have been studied from two angles to determine, first, whether they give us information of an inferential nature which enables us to say that a localized or general enterocolitis is or is not

7. Emery, E. S., and Monroe, R. T.: Boston M. & S. J. **197**: 337-345 (Sept. 1) 1927.

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tuberculous and, secondly, whether or not, when they exhibit gross deformity, that deformity is due to tuberculosis in contradistinction to the deformity caused by other and nontuberculous inflammatory ailments involving the bowel.

In our class 1, the roentgen evidence is what we usually regard as inferential. When the tuberculous process affects only the appendix or a small area of the terminal ileum or cecum, actual deforming lesions are difficult to demonstrate, either by progress meal or by barium enema. Similar lesions to those exhibited by Brown and Sampson can be obtained roentgenologically when nontuberculous disease affects the ileum, cecum and ascending colon. However, there is a possible distinction: nontuberculous, enterocolonic disturbances of early grade rarely confine themselves to the last 18 inches of the ileum, the ileocecal valve, the cecum and the first 12 inches of the colon. Thus, in a person who has pulmonary tuberculosis or evidences of bone or joint tuberculosis, even though, symptomatically, his dyspeptic disturbances are slight, the presence of extreme irritability and of spasm practically confined to the small territory of terminal ileum, cecum and colon should indicate tuberculous disease until it is proved otherwise. We feel that Brown and Sampson are justified in calling attention to the extreme spastic irritability of the terminal ileum and the proximal colon when early tuberculosis exists. We believe that this "irritability" (hyperperistalsis, hypertonicity) is due to the peculiar, simultaneous involvement of terminal ileum and colon, interfering, as has been mentioned, with the normal neuromuscular physiology of the region. The extreme irritability exhibited by these segments of the bowel is as characteristic as is the extreme irritability, with pain, recognized as an important symptom of tuberculosis of the urinary bladder. We are of the opinion that no person in whom pulmonary tuberculosis is proved or suspected can be considered as having been properly examined without a roentgenologic study of the alimentary tract.

Fig. 4.—Roentgenologic aspect of colon (barium enema) of patient of class 2: I, deformity and imperfect filling of terminal ileum; II, extensive deformity, accompanied by thickening of the wall and localized muscular and mucosal lesions of cecum and ascending colon.

In our classes 2 and 3, the roentgen studies almost uniformly revealed evidences of gross, deforming lesions. These lesions seriously alter the architecture of the terminal ileum and colon and produce reasonably characteristic pictures: characteristic, largely, because we know of no other chronic, progressive, infectious ailment which limits its major pathologic manifestations to the terminal ileum, cecum and colon. However, progress meals give less information than do barium enemas. Even pictures taken after barium enemas may

Fig. 5.—Appearance of colon (barium enema) of patient in class 3: Early generalized involvement of the mucous membrane of practically the entire colon, accompanied by pronounced mucosal and muscular irritability (note that in the transverse and ascending colons, peristalsis is too rapid to allow colon margins to be defined sharply).

be deceptive as to the extent of the lesion unless series made before and after the physiologic exhibition of an antispasmodic, such as atropine, are compared; pronounced spastic contractures may convey an exaggerated idea of the extent of the ulcerative lesion and its associated injury. It is important that this be appreciated, since, unless one has a true conception of the position and extent of the disease, therapy may be misdirected or incomplete.

MODE OF MANAGEMENT

Space does not permit more than a brief statement of our position regarding the management of tuberculous enterocolitis. Only general principles of treatment can be mentioned. If patients are segregated into classes, as ours have been in this discussion, we have shown that class 1 comprises a group of patients in whom pulmonary lesions are not extensive, and in whom commonly the bowel disturbance is localized. In this group of patients, we feel that the common sanatorium "wait-and-see-what-happens" attitude is not sound. It is true that the bowel in patients of class 1 often exhibits a remarkable capacity for repair, but from few sanatoriums come reports of complete cure of tuberculous enterocolitis once the disease has become established. It is our firm opinion that active therapy should be directed toward such patients as we have listed in class 1. By this we mean that early exploratory laparotomy should be performed and, whenever possible, the localized disease should be removed sur-

gically. Archibald [8] has shown that, when the enteric disease is localized, surgery is of great value. The frequent occurrence of appendix and ovarian lesions in our classes 1 and 2 would seem to indicate that, if at operation for removal of ovaries, tubes and appendixes, careful examinations were made to demonstrate whether or not the tissue is tuberculous, much might be done with regard to preventing future ileac and cecal involvement. If surgical exploration is carried out in more patients in whom tuberculosis is probable or is suspected, the local disease may be removed, just as are early malignant growths of the stomach and breast. This local eradication may hold the key, prognostically, to the future of the bowel in the tuberculous patient. Further, early surgical exploration, done more frequently than is at present the vogue, will greatly increase our knowledge of the initial appearance and distribution of tuberculous disease.

In our class 2, surgical exploration should be suggested only when evidence is at hand to indicate that the pulmonary lesion is not extensive or actively progressing and that the bowel disturbance is limited in its distribution to the terminal ileum, cecum and ascending colon. Wide dissection, under local or spinal anesthesia and nerve blocking, is possible; practically all of the thoracically tuberculous patients can be managed without general anesthesia.

Study of the cases comprising class 3 would indicate that surgical measures, undoubtedly, are contraindicated.

The general management of tuberculous enterocolitis should be in conformity with the following broad principles. Not rarely, however, many of these principles are disregarded:

The diet should be arranged so that the residue remaining after digestive absorption is scant. Certainly, one cannot give "rest to the affected part" if the terminal ileum, cecum and colon are constantly and vigorously employed in holding and moving a large volume of roughage or other nonabsorbable residue. It is our custom to interdict from patients in whom presumably or definitely there is tuberculous enterocolitis all residue-producing foods. Further, we do not permit raw milk. If milk is taken, it should be citrated or parboiled. The value of milk has been overestimated: very frequently, stool examinations disclose large, tough, unsplit milk curds. Not only are these mechanical irritants, but they furnish ideal culture mediums for the tubercle bacilli and other organisms peculiar to the alimentary canal, particularly the colon. Quite as much nourishment as is derived from milk can these milk substitutes are usually well borne. Caution be obtained from malted or chocolate malted drinks;

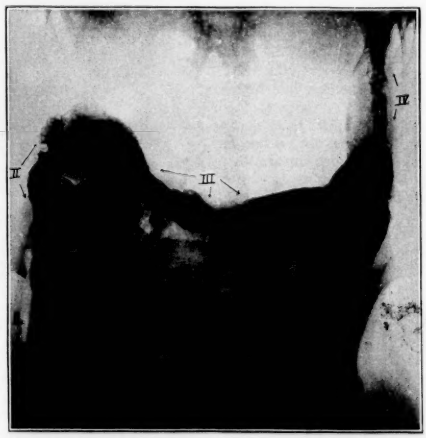

Fig. 6.—Appearance of colon (barium enema) of patient in class 3 showing extensive obstructive and deforming lesions: I, deformity in terminal ileum; II, III and IV, ulcerative lesions, fibrosis and narrowing in ascending, transverse and descending colons; V, stiff, fixed, adherent, fibrous sigmoid.

must be directed against overfeeding. The caloric value of the patient's diet should be calculated along the lines that basal diets are calculated for persons who have diabetes, with the possible exception that when the patient is febrile, fluids should be pushed and possibly the total number of calories decreased 25 per cent. Diets should be arranged and varied with respect to their vitamin content. All too frequently this is neglected, and such neglect seems to reduce the capacity to heal.

It is our opinion that the fattening process common in the dietetic management of the tuberculous does more harm than good. Tremendous food intake throws a great burden on the patient's alimentary tract from the secretory and the motor aspects. In such circumstances, early tuberculous lesions of the lower ileum and the colon are most unfavorably placed with regard to healing. It is better to have a rather thin tuberculous patient, whose food intake is all used for building up reserve and resistance, than to have a plump patient whose secretory, motor and storage capacities are constantly overtaxed.

In addition to dietetic rest to the affected part, it is our custom to suggest that tuberculous patients stay in bed, not alone as long as they are febrile, and dyspeptic symptoms are present, but until pain, spasms, loose stools, nausea and vomiting disappear. While they are in bed, painful abdominal spasms can be alleviated by fomentations. In some instances, various forms of heliotherapy appear to have value in relieving pain and in promoting general comfort. We are not yet ready to subscribe to the opinion that heliotherapy treatments have any curative influence whatever on the intestinal lesions in tuberculosis. Study of the literature and of pathologic specimens shows such a great variation in the character of the tuberculous bowel lesion and the efforts at resistance that it is difficult to believe that, in the specimens exhibited to prove healing by the proponents of heliotherapy, the healing actually resulted from heliotherapy.

The pains, bowel irritation and constipation of early tuberculous enterocolitis can be relieved by the free exhibition of liquid petrolatum; a 1 ounce (30 cc.) dose may be given from four to six times daily. The liquid petrolatum acts as a protectant to ulcerated mucosa and this protection may have significance with regard to healing, not only by preventing trauma from intestinal contents but by quieting spasms. At times, the use of medicated oil, rectally, at bedtime, proves helpful: 6 ounces (180 cc.) of warm cottonseed oil may be introduced slowly and retained throughout the night. When spastic contractures and local ulcerations are marked, the admixture to the oil enema of 20 grains

8. Archibald, E. W.: Canad. M. A. J. **10**: 804-826 (Sept.) 1920.

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(1.3 Gm.) of orthoform and one-half grain (32 mg.) of extract of belladonna gives added comfort. In severe cases, opium, camphorated tincture of opium and morphine may be required.

In the late stages of the disease, when diarrhea is distressing, the diet should be altogether fluid; the patient should be kept in bed, and attempts should be made to control the diarrhea medicinally. The exhibition of 60 grains (4 Gm.) of bismuth subgallate in a small quantity of hot water, after each bowel movement, frequently proves helpful. Given in this way, the continuance of the dosage is automatically regulated. Severe diarrhea, not controlled by these measures, commonly is managed by irrigating the bowel once or twice daily with physiologic solution of sodium chloride at a temperature of 105 F. and by the exhibition of opium. In some instances, irrigations with solutions of silver nitrate (1:2,000), tannic acid (1:1,000) or mercurochrome-220 soluble (1:5,000) at a temperature of 105 prove helpful.

Disposal of the feces of tuberculous patients, particularly when there is enteric involvement, should receive careful attention. All bedpans and commodes should be sterilized by boiling or by hot steam. The feces should be sterilized by one of the organic peroxides or by boiling water before they are allowed to pass into the general sewer.

920 North Michigan Avenue.

ABSTRACT OF DISCUSSION

DR. ROBERT S. BERGHOFF, Chicago: Intestinal tuberculosis is present in a very appreciable percentage of all cases of far advanced active pulmonary tuberculosis. The symptoms are atypical, sometimes masked, rendering an early diagnosis difficult. Numerous workers have shown the relative frequency of undoubted primary mesenteric gland tuberculosis, with not a trace of tuberculosis in the intestinal wall. Bacilli can pass through the walls of the intestinal tract without leaving a trace, and once through the mucous membranes are carried to the mesenteric glands, or may be carried with the chyle to the thoracic duct, and then into the blood stream. This procedure is the very antithesis of the primary infection of childhood. In the primary infection, the tubercle bacillus is inhaled, passes down the bronchus and lodges in an alveolus. Tubercle bacilli multiply and a tubercle is formed. This tubercle caseates, and because lung tissue does not possess any specific defense, it must rely on the lymphatics. The regional lymph glands then take part and encapsulate the tubercle bacillus and detritus from the lung within their parenchyma. The pathologic manifestation of tuberculosis irrespective of where it is encountered, in whatever organ or structure, is basically the same, and consists of the tubercle. In intestinal tuberculosis, however, the tubercle shows a tendency to rapid and widespread disintegration, with resultant ulcer formation. It is encountered most frequently in the ileum and cecum. Peyer's patches are a common location, as in typhoid. However, the tuberculous ulcer shows many striking differences from the typhoid ulcer. In the first place, it is almost always multiple, in contrast to the not infrequent solitary ulcer seen in typhoid. Next, it spreads transversely around the intestine, often completely encircling it, instead of following a longitudinal path as in typhoid, the reason being the circular direction of the lymphatics, by which it spreads. A typhoid ulcer is prone to perforate rapidly; the tuberculous ulcer perforates infrequently, the reason being that there is a greater tendency to granulation, thickening, and new tissue formation. The walls and edges are thickened and raised, but not undermined as in typhoid. The floor is caseous and often shows miliary tubercles. As a rule, all coats of the intestine are involved, including the serous, which leads to adhesions and peritonitis. The prognosis of intestinal tuberculosis has brightened perceptibly in the past two decades. Marked improvement and undeniable cures are quite frequent. The reason is twofold: (1) earlier diagnosis, and (2) the addition of therapeutic measures of real value, particularly artificial heliotherapy.

DR. MORRIS WEISSMAN, Chicago: The main objection to the operation advised by Dr. Smithies is that one can at no time hope to remove the entire lesion. Even though the transverse and the ascending colons are the seat of the infection, there are other points in the intestines at which tuberculous lesions are present, and one cannot hope to reach all of them. There may be one other objection. If the original pulmonary focus of infection is still present, how can one hope to avoid a reinfection? The answer to these objections is: True, we cannot hope to eradicate the entire tuberculosis-bearing area, but we can hope by operation to relieve the patient and then depend on his own defensive forces. After all, a left over solitary lesion in the intestines will, perhaps, not be enough to cause discomfort. The patient's comfort is greatly disturbed by the fact that there is a mass of infection in the cecum and colon. I sometimes view the situation much as the surgeons do a tuberculous knee joint resection. They do not hope to resect the entire tuberculosis-bearing area in the knee joint. They excise the cartilages and bring solid bones together for immobilization. It may be argued, however, that in the knee joint one immobilizes, while in the intestines one can never hope for immobilization. The answer is that the ordinary mobility of the intestines is not harmful. It is the irritative mobility that is harmful. By excising that irritation point, there is the possibility that the patient will be greatly relieved, even though he may not make a complete recovery. As far as heliotherapy is concerned, this agent should be used but should not be depended on solely. In the Municipal Tuberculosis Sanitarium, we have not had the success that Lawrason Brown had in his cases. We followed his technic very closely and yet we could not get his results, possibly because he treated patients with heliotherapy who did not have tuberculosis at all. That is perhaps a daring assumption, but in the light of our experience at the sanatorium, that is the only conclusion we can arrive at. We must assume an active attitude toward intestinal tuberculosis instead of a passive one. Our sanatoriums, instead of being merely places of rest and repose and, oftentimes, vegetation and decay, should be turned into active hospitals, so that when thought necessary abdominal section could be performed. Without it, I think the situation is thoroughly hopeless.

DR. OSCAR O. MILLER, Louisville, Ky.: In our sanatorium it is a routine practice to make a roentgen examination of the gastro-intestinal tract of every patient admitted, because many cases of tuberculous enterocolitis are masked. About 90 per cent of the far-advanced cases will show definite tuberculous enterocolitis, but there are a few cases of minimal tuberculosis that show definite evidence on examination. Whenever a patient fails to improve, even though the pulmonary lesion is becoming arrested, we feel that that patient has a potential tuberculous enterocolitis. Patients with the so-called fetal or tapering cecum we have rarely proved tuberculous. Occasionally, one sees a patient who has a marked chronic constipation with a very definite and advanced tuberculous ulceration throughout the intestine.

DR. H. C. SWEANEY, Chicago: Tuberculosis of the gastro-intestinal tract is a lymphatic disease not greatly different from that in any other part of the body. If the anatomic structures of the lymphatics at different ages are recalled, one can understand the varying nature of this disease during the different periods of life. Anatomically, the young person has well developed lymphatics. In the young person, these lymphatics show very marked enlargement, and ulcerations and hypertrophy quite similar to typhoid ulcers. That has been the rule, particularly when the disease is found in young girls of 15. I defy any one without a very careful examination to distinguish these ulcerations or these early hypertrophic lymph glands from the pathologic changes of typhoid. Of course, there are differences. Dr. Berghoff discussed some of these. In midlife, perhaps, there is a development of immunity. This immunity or allergy can be expected to be a cause of localization of these lesions. Therefore, at that time of life we are apt to find a circular type of ulcer in the chronic stage of the disease. I have seen longitudinal hypertrophic lymphatic

glands with longitudinal ulcers in the young, while in older persons there is a greater tendency toward the formation of the round and annular ulcer. Physiologically, the subject may be discussed from a mechanical and chemical standpoint. Mechanically, there are two places in particular in which there is a stasis, and this stasis causes a better opportunity for the bacilli to penetrate the mucosa; that is, above the ileocecal valve and above the rectum. That is where ulcers occur with greatest frequency. Trauma is also a factor. Chemically the conditions in the lower part of the tract are more conducive to the development of the tubercle bacillus. Tuberculous enteritis forms a crescendo-like curve, beginning from the stomach (very rarely in the stomach), reaching its height around the ileocecal valve and diminishing toward the rectum.

DR. FRANK SMITHIES, Chicago: I have mentioned in the paper practically everything that has been brought up in the discussion. I want to emphasize again that, in patients in group 1, evidences are at hand that the condition being dealt with is a localized infection. In tuberculous enterocolitis the same situation exists now as that with which we had to deal in regard to carcinoma of the stomach and breast twenty years ago. The same arguments against surgical intervention that have been brought forward here this morning were at that time brought forward against surgical intervention in carcinoma of the stomach and breast. Metastases from such cancers are borne by the lymph stream, just as in many instances tuberculosis is spread through the lymphatics. Yet early operation cures cancer. With respect to tuberculosis, there is today appearing a radical change in the point of view. In this attitude I am supported by the work of Archibald of Canada. His surgical results are encouraging. I do not dispute what has been said in criticism of the effects of these operations, but our material indicates that if we can eradicate the disease while it is yet local the patient will be benefited. Furthermore, frequent abdominal exploration will teach us where and how the disease originates in the abdomen, something which cannot be learned when autopsy exhibits widespread involvement. This will be a great advance in knowledge. By extirpating local disease and relieving dyspeptic disturbances, we may be able to feed these patients better, give them more rest, get rid of exhausting diarrhea, and increase their healing capacity. Regarding the healing of ulcers by heliotherapy, I have gone over this phase of therapy carefully. If any one will read the book of Brown and Sampson, he will agree with me that the cases of bowel ulcer which they exhibit as having healed spontaneously are quite as convincing as are those cases which they present to show the effects of heliotherapy as a curative agent. The capacity for healing varies greatly in different patients and in the same patient at different times. This is a confusing factor in appraising the value of healing agents. With tremendous material at our hospital in Chicago, properly controlled and with a large staff carefully looking for everything that might benefit the patient, there has not yet been seen an instance of tuberculous enterocolitis in which heliotherapy definitely can be said to have been the agent that healed the lesions. Like psychotherapy, heliotherapy is a remarkable therapeutic adjunct. It relieves pain, allows rest, gives the patient something to fill his day, and may, in our sometimes befogged city, bring a little more sunshine into his life than he would have otherwise.

Coagulation of the Blood in Jaundice.—The prolonged coagulation time of the blood often noted in jaundiced patients has long been recognized as of serious import in relation to surgical measures. Postoperative bleeding, a grave complication, usually occurs when there is delay in coagulation. The coagulation, calcium and prothrombin times are frequently prolonged in obstructive jaundice, particularly if the jaundice has existed for three or more weeks. The exact nature of the disturbance in the mechanism of coagulation of the blood, however, is unknown. Available data indicate inhibition of the formation of thrombin and partial inactivation of the thrombin already formed. The calcium and fibrinogen content of the blood, according to most investigators, is undisturbed in these cases. —Johnson, W. R., and others: Studies in Experimental Extracorporeal Jaundice, *J. Exper. Med.*, Dec. 1, 1928.

THE PHYSIOLOGY OF MICTURITION

REPORT OF A NEW INSTRUMENT FOR DETERMINING PRESSURE AND VOLUME *

FRANCIS H. REDEWILL, M.D.
SAN FRANCISCO

As pointed out by Elliott [1] more than twenty years ago, vesical innervation varies in different animals and, as shown by recent writers, the resultant stimuli passing up and down healthy nerves of the same species vary, to a certain extent, in the nerve paths followed to and from the bladder. Furthermore, the arrangement of the healthy vesical unstriped musculature varies when a series of empty, partly filled and filled cadaver bladders are compared. Therefore, the mass of conflicting experimental evidence that has accumulated with regard to the physiology of micturition is not to be wondered at. It is my purpose in this paper to present briefly some recent discoveries as to the physiology, and then to apply these facts in determining the pathology of bladder conditions by means of a new vesical pressure volume and time recording instrument.

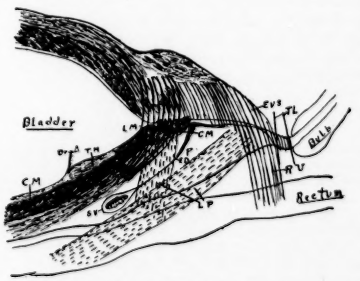

Fig. 1.—Micturition, sphincters closed (sketch by the author modified from drawing by Young and Wesson: J. Urol. **4**: 296, 1920). The external vesical sphincter (*EVS*) of striated muscle is continued on to the rectum as the recto-urethralis (*RU*) muscle. The levator prostatae (*LP*) muscle—striated—which is a part of the levator ani is diagrammatically represented. Other nomenclatures are: trigon muscle (*TM*); circular bladder muscle (*CM*) and longitudinal muscle (*LM*). The two layers of the triangular ligament are represented by the lines *TL*. Note that the longitudinal and circular muscles arcuate above and below, respectively, around the prostatic urethra. This sketch is presented particularly to show the angularity existing when the sphincters are closed between the pendulous urethra (at bulb) and the prostatic urethra.

ANATOMIC MECHANISM OF MICTURITION

The high lights of the more recent observations concerning the mechanism of micturition are these:

1. The trigon muscle is a separate entity from the outer vesical longitudinal and inner circular layer of the bladder, and the unstriated muscle fibers of this V-shaped area arise from the longitudinal layer of the ureters. These muscle bands approximate one another toward the urethral orifice, changing from fan shaped to a round bunch of muscular fibers on the floor of the urethra. These fibers for their whole length lie just beneath the mucosa and some of them extend down past an attachment to the verumontanum even to the membranous urethra (fig. 1).

2. The internal and external sphincters of the bladder are surgical and not anatomic entities, and the internal

* Read before the Section on Pathology and Physiology at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 15, 1928.

1. Elliott, T. R.: The Innervation of the Bladder and Urethra, J. Physiol. **35**: 367, 1906-1907.

sphincter, composed entirely of smooth muscle, besides consisting of the trigon is also composed of two sets of arcuate fibers, the external arcuate being an extension of the outer longitudinal vesical layer and the inner arcuate being composed of fibers extending from the inner circular muscular layer of the bladder.

3. The external sphincter of striated fibers has its origin laterally with a few bundles beginning at the vesical orifice and increasing in number toward the apex of the prostate, where these muscle fibers completely invest the urethra, most of them in circular order, and continue to encircle the urethra completely in the membranous urethra portion and on into the bulb; also, these striated fibers extend back to the rectum, becoming the rectro-urethralis muscle.

4. Anterior fibers of the levator and striated muscle are attached to the prostatic sheath and are known as the levator prostatae bands.

INNERVATION OF MUSCULATURE

As to the innervation of these sets of muscles, one must keep in mind two main sets of nerves: the sympathetic and the parasympathetic.

1. The sympathetic arise from the last lumbar thoracic and upper lumbar, and by way of the inferior splanchnics to the inferior mesenteric ganglions, radiating thence by the hypogastric nerves and plexus to the fundus of the bladder and lateral walls, to the trigon, and to the circular arcuate muscles, just described, of the internal sphincter.

2. The autonomic sacral nerves, or parasympathetics, arise from the sacral branches and supply the walls of the bladder and the arcuates of the internal sphincter but they do not supply the trigon muscle. Also arising from the sacral roots are the pudic nerves that supply the voluntary striated muscles, i. e., the external urethral sphincter, the rectro-urethralis and the levator ani, the prostatic portion of which either elevates or lowers the prostate and the base of the bladder.

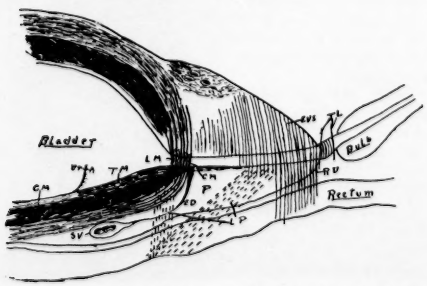

Fig. 2.—Micturition; sphincters open. The nomenclature is the same as in figure 1. Note angularity of prostatic urethra reduced with sphincters relaxed, the urethra becoming almost a straight tube during micturition.

ACT OF MICTURITION

The act of micturition involves the following sequence: With the bladder normally filling with urine, the inhibitory fibers of the sympathetic relax the bladder wall and the tonic fibers of the same nerves keep the arcuate fibers of the internal sphincter on a tension and pressed against the dorsally placed urethral handle of the trigon, with the verumontanum probably also aiding in the closure. When the bladder becomes quite distended or overdistended, the voluntary external sphincter, as well as the recto-urethralis and the dorsally placed fibers of the levator ani, aids in holding the urine as a result of stimuli from the pudic nerves. The last two sets of voluntary muscles aid in the closure by pulling the prostate base upward and backward, thus increasing the angulation that exists at the triangular ligament with the transverse perineal muscles and membranous urethra.

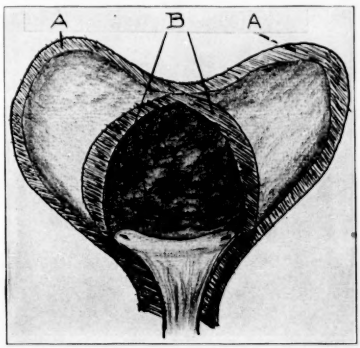

Fig. 3.—Twin pear herniation of bladder fundus: *A*, expanded; *B*, contracted. This bilateral herniation or cystocele was discovered with the use of the Redewill cystometer. No other pathologic condition was found in the urinary tract. The urine was normal. The patient complained of having to void twice in order to empty the bladder. When 160 cc. of fluid was injected with the cystometer attached, voiding sensation was stimulated with a rapid increase pressure to 30 mm. When this tendency was disregarded and the injection of fluid continued, the pressure dropped to 20 mm., and 600 cc. more of the fluid was injected before the bladder capacity was reached. A diagnosis of herniation of the bladder wall was confirmed by means of the cystoscope and x-rays.

The first act of voiding is voluntary, with the relaxation of the external sphincter and with the laterally placed fibers of the levator ani pulling the prostate-base downward, thus decreasing the angulation at the membranous urethra. Then the involuntary action is principally through the parasympathetic nerves, stimuli from which contract the bladder wall and relax the arcuate fibers of the internal sphincter, while stimuli through the sympathetics induce the trigon muscle to contract, foreshortening the prostatic urethra and depressing the vesical floor. The contraction of the trigon muscle is forceful, and, as can be seen with the cystoscope, may even pull the verumontanum into the bladder cavity (fig. 2).

With many of these questions as to innervation and nerve action thus cleared up by Macht,[2] Macht and Young,[3] Young and Wesson,[4] and Rose and others,[5] the perplexing question up till now remained, Why do sympathetic nerve stimuli act on the trigon muscle while all the rest of the involuntary muscles of the bladder have predominating impulses from the parasympathetic? We think the following is the explanation:

As will be recalled, the longitudinal muscles of the ureters extend into the trigon. Macht has shown with the use of nicotine that ganglionic fibers also exist in

2. Macht, D. I.: J. Urol. **4**: 279, 1920.
3. Young, H. H., and Macht, D. I.: J. Pharmacol. & Exper. Therap. **22**: 329 (Dec.) 1923.
4. Young, H. H., and Wesson, M. B.: The Anatomy and Surgery of the Trigon, Arch. Surg. **3**: 1 (July) 1921.
5. Rose, D. K.: Determination of the Bladder Pressure with the Cystometer, J. A. M. A. **88**: 151 (Jan. 15) 1927. Rose, D. K., and Deakin, Rogers: A Cystometric Study of the Pharmacology of the Bladder, Surg. Gynec. Obst. **46**: 221 (Feb.) 1928.

the trigon muscle. During the act of voiding, the sympathetics stimulate the longitudinal fibers of the ureters to foreshorten, thus drawing the ureters upward, so that instead of the mouths of the ureters being protruding lips there is actual umbilication with actual plugging of the ureteral openings. This also probably explains why there is no ureteral reflux during the increased intravesical pressure of voiding.

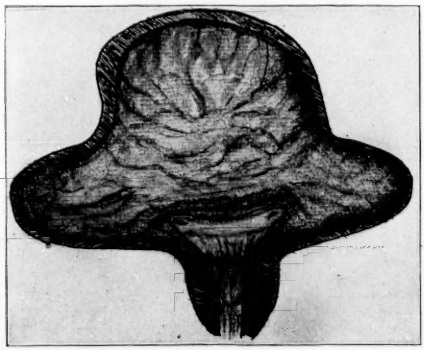

Fig. 4.—Dumb-bell herniation or cystocele of lateral walls in a case of slight obstruction of the vesical neck with trabeculation and cystitis. Diagnosis of the condition was made with the cystometer in the same manner as described in figure 3.

The impulse transmitted to the longitudinal muscular layer of the ureters is probably carried down by the nerve filaments to the trigon muscle, which, as was said before, has its origin in this outer layer of the ureters. Thus not only are the ureters foreshortened during voiding, but the same impulse also causes traction of the trigon muscle, depressing the floor of the vesical neck.

In order to interpret accurately lesions in any groups of nerves and muscles utilized in the normal act of voiding, it is necessary not only to be familiar with these modern thoughts regarding the physiology of micturition but to have an instrument that can simultaneously record these three factors: (1) the pressure developed in the bladder on filling and emptying; (2) the amount of fluid in the bladder, and (3) the time element. Two years ago Rose described a machine called a cystometer which recorded the first two elements. Whereas his machine is hand driven, mine runs entirely automatically and also records the time in fifths of seconds.

IMPORTANCE OF TIME FACTOR

Before describing the instrument, I wish to point out several bladder conditions in which the time element is a paramount factor in both filling and emptying. We speak of physiologic and pathologic herniation of the different walls of the bladder, or cystocele. Thus, with my cystometer I discovered three dumb-bell shaped bladders with herniation laterally in which the filling time could be divided into two periods with a marked pause between; two periods were also required for the emptying. These bladders had herniation laterally (fig. 4), and in one case it required a three minute pause after a partial voiding before the bladder would start to contract again to obliterate the herniations and completely empty itself. Then there are the twin pear bladders with herniation toward the fundus (fig. 3) and finally one may run across an hour-glass bladder (fig. 5). In these cases the cystometer recording the time factor aids materially in the diagnosis, and in certain cases it is the only means there is of making a diagnosis. Physiologic solution of sodium chloride or boric acid used in the cystometer without inconvenience to the patient can dilate the bladder to its capacity, whereas opaque mediums used to make cystograms irritate the mucosa, producing reflex stimuli that induce parasympathetic impulses to the bladder musculature, causing tension and a tendency to contraction. Such a tension prevents complete relaxed dilatation of the bladder wall and thus any tendency to herniation is missed in the cystogram.

For the past year, urologists in Paris have been using barium solutions in the bladder for fluoroscopic study, as the enterologists use it in gastro-intestinal examinations. Remarkably clear visual pictures are thus obtainable. Such study aids in the diagnosis of such conditions as tumors of the bladder, ulcers, trabeculation, cellules, diverticula, both fixed and contractile, malformations, reflux into the ureters, and the filling and emptying time.

The barium solution in conjunction with the fluoroscope is a harmless new aid in studying the physiology of normal and pathologic bladder conditions. The barium is by far the most preferable of the opaque solutions because, unlike the iodides, bromides and strong nucleates of silver, it is not irritating to the mucosa and can be easily washed out of the bladder following the tests. But with the fluoroscopy test, as far as the physiology of filling and emptying the bladder is concerned, nothing can be ascertained in regard to the pressure attained in filling the bladder during micturition.

Fig. 5.—Hour-glass bladder: diagnosis made with Redewill cystometer. The diagnosis was confirmed by the x-rays. The bladder seemed to fill at 20 mm.; then the pressure jumped to 55 mm. with a tendency to void at 150 cc. What at first seemed puzzling was the fact that the injecting fluid maintained at the comparatively high pressure of 55 mm. could be injected slowly past the 150 cc. capacity until the bladder contained a total of 275 cc. of fluid.

With the use of a suitable instrument for recording both volume and pressure, the following factors can be determined:

1. The point at which desire to void is first noted.
2. The capacity of the bladder with intracystic pressure becoming severely painful.
3. The emptying pressure.
4. The promptness of emptying, thus indicating tonicity of the bladder wall.
5. The characteristics of various types of urogenic bladders, which will be discussed subsequently, particularly with regard to injury and blocking of (*a*) the sympathetic, (*b*) the parasympathetics and (*c*) the pudic nerves.

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Two years ago, Rose described a large intricate apparatus for taking just such measurements of the bladder, and last year he entered into a detailed consideration of the diagnosis of urogenic lesions with the same apparatus, following which there was considerable discussion.

THE REDEWILL CYSTOMETER

I have devised an apparatus (fig. 6) that is light and portable, that can be placed on the cystoscopic table,

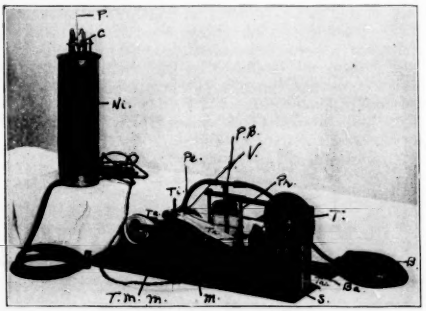

Fig. 6.—Redewill cystometer: Note 1,000 cc. nickel container (*Ni*) from which, when suspended, solution flows by gravity as from any irrigator. Toothed plunger (*P*) attached to float in container (*Ni*) moves past commutator *C*, with raising and lowering of float in container. Each tooth passing the commutator makes and breaks the electric circuit generated at battery (*Ba*). This current acts on the magnet (*M*), which moves *V* arm in 0.5 cm. excursions and records on tape (*Ta*) liquid entering the bladder, represented by rubber bag *B*, and transmits the variance in pressure to pressure bottle *PB*, which, in turn, acts on tambour *T*. To the tambour is attached pressure arm *Pr*, which transcribes any excursion of that arm on moving ape (*Ta*) by glass ink pen at *Pe*. Tape moving mechanism (*TMM*) draws the tape at any regulated speed by clockwork mechanism. Also attached to this mechanism is a time ticker (*Ti*) with metal pen attached that records time in fifths of a second.

and that can easily be connected to a catheter or cystoscope. The pressure of the solution is obtained by the usual gravity method. The amount of solution used is indicated on the chart by an electrically connected float that transcribes by means of an electric manometer. The pressure is transmitted through an air chamber to a highly elastic tambour that also transcribes with a marker on the moving chart (fig. 7). The tape can be as long as desired and revolves or, rather, unwinds on a barometer, which instrument also runs a timer. As a result, the moving tape has written on it three curves: (1) the time in seconds; (2) the volume in cubic centimeters, and (3) the pressure curve ranging from 0 to 80 mm. of mercury.

Bringing the time element into play (fig. 8) in the pressure and volume readings is another important improvement over the Rose machine in that the time required for filling and emptying is an important aid in diagnosing pathologic conditions. As an illustration: In mild subacute cystitis with the sympathetic nerve terminals in a state of irritation, one will find that the bladder will not hold half the amount of solution; i. e., the voiding pressure will be made manifest before the bladder is half full, if one takes only thirty seconds to run in the first 100 cc. instead of four times that time, or two minutes.

With the gravity method of my instrument, the pressure and flow is uniform in a given case, but with the Rose cystometer, in which a hand pump is used, the human element is a big factor and the flow of solution is not constant at any time. Thus it is necessary to chart the time in each instrument, so that no one knows the flow of the solution in cubic centimeters per second.

The valuable points of my machine are as follows:

1. The working parts are indestructible.
2. The whole machine is light and portable.
3. The record is taken on standard cash register machine blank paper tape, and ink is used in the three pens, thus rendering the record permanent and not mussy and cumbersome like the use of smoked paper on a large revolving drum.
4. Three records are recorded simultaneously: (*a*) the amount of solutions entering the bladder; (*b*) the pressure developed in the bladder at all times, i. e., filling and voiding, and (*c*) the time consumed for these operations.
5. As the irrigating vessel is made of german silver, the glass air pressure chamber and tubing can all easily be sterilized by the same methods that are used in any irrigating apparatus; then the machine can be connected up directly with a catheter or with a cystoscope.
6. If fluoroscopic study is to be made, a barium solution can be used in the apparatus, which is connected up directly with a catheter to the patient, instead of a clear solution, and fluoroscopic readings are made not only with the eye but also simultaneously with the machine. Some of the points to be noted in operating the machine are:

(*a*) The gradual filling pressure.
(*b*) The point at which the bladder is filled to capacity, indicated by painful tenesmus sensation.
(*c*) The emptying pressure.
(*d*) The time of emptying, determining in an unobstructed bladder the tonicity of the bladder wall.
(*e*) Corrections for leakage around the catheter and intra-abdominal pressure due to contraction of abdominal muscles.

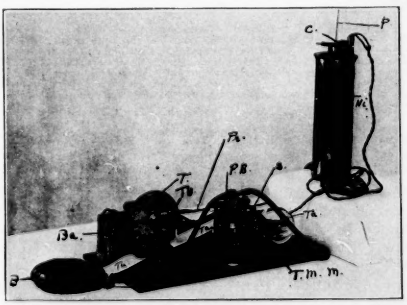

Fig. 7.—Redewell cystometer: View from other side of that shown in figure 6. Note particularly pressure bottle (*PB*) with attachment to rubber bladder (*B*). Screw (*S*) regulates spring attached to pressure arm (*Pr.*). Tambour (*T*) is connected with pressure bottle by tube (*Tu*).

The types of cases in which this instrument is decidedly useful as a new aid in diagnosis are:

1. To determine at once whether the bladder is normal in regard to (*a*) its capacity; (*b*) the condition of the muscular wall; (*c*) the condition of nerve innervation; (*d*) the condition of the bladder surface, and (*e*) the presence of obstructions. A study of any catheterized bladder with the use of the cystometer and fluoroscope will determine the normal condition in short order.

2. To determine the type and degree of obstruction.

3. To determine type, size and whether contractile or rigid diverticula are present.

4. To determine actual benefits incurred by comparing cystometric records before and after operations on the bladder and prostate.

5. To record, on a cystometric chart, the gradual outflow and pressure retained when a bladder with considerable residual is emptied.

6. To determine the type of neurogenic bladder, which under the Head classification would be involvement of (*a*) the sympathetics, (*b*) the parasympathetics, and (*c*) the dorsal roots.

NEUROGENIC BLADDERS

The most important nervous disease affecting the bladder is tabes dorsalis, or locomotor ataxia, and very often the initial symptoms of tabes are the bladder symptoms. The first portion of the urinary apparatus affected in this disease is the detrusor muscle, and both sensory and motor paths are usually involved. Any combination of symptom complex may be expected in tabes, such as (1) spastic condition of the sphincters with loss of tone of muscular wall causing retention; (2) loss of tone of muscle wall with only slight temporary spastic condition of the sphincters which results

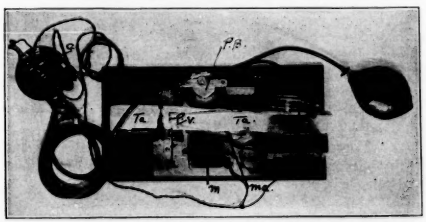

Fig. 8.—Redewill cystometer: View from above. Note, particularly, the three elements recorded on the tape *Ta:* the time ticker (*Ti*); the volume indicator (*V*), and the pressure indicator (*P*). The first records time with a metal pen in fifths of a second. Each excursion of the volume recording pen indicates that 10 cc. of solution has entered the bladder cavity. The pressure arm, with glass pen attached, moving from left to right, records 4 mm. of mercury pressure for each millimeter of pressure arm excursion.

in overflow incontinence, and (3) complete sphincter paralysis with true incontinence.

Since in 80 per cent of these tabetic cases bladder symptoms are present, and this condition may exist even in young children with inherited syphilis, it can readily be seen why a bladder examination with the new cystometer apparatus will very often lead to the first absolute diagnosis of tabetic bladder. In these cases the capacity is greatly increased and the voiding pressure is considerably lowered.

In obstructions of the vesical neck the opposite picture is the rule; namely, small capacity and high voiding pressure.

Other nervous diseases in which the bladder may be involved with its innervation are cerebospinal syphilis, transverse myelitis, toxic sclerosis, pernicious anemia, diabetes, spina bifida, multiple sclerosis, and ataxic paraplegia. In any of these conditions the cystometer is a valuable adjunct in aiding diagnosis.

SUMMARY

1. In studying the physiology of micturition, the cystometer that I have devised has proved especially valuable in that it records the time element during the process of filling and emptying of the bladder, thus indicating variance in tonicity of the bladder wall and making it possible to diagnose such conditions as physiologic or pathologic herniation.

2. Barium solutions can be used as irrigating mediums to study pathologic bladder conditions with the fluoroscope.

3. The new portable cystometer will aid materially in studies of the bladder and its action with the cystoscope and fluoroscope.

4. With this new cystometer, the time element, as well as volume and intravesical pressure, are simultaneously recorded with ink on tape that remains as a clean, inexpensive, permanent record.

5. Neurogenic conditions of the urinary bladder, as well as tumors, diverticula and obstructions of the vesical neck, are more easily and quickly diagnosed in children and in adults by utilizing, along with other measures, the new cystometer.

Flood Building.

MILK SICKNESS AND THE METABOLIC DISTURBANCES IN WHITE SNAKE-ROOT POISONING*

HAROLD A. BULGER, M.D.
FRANCIS M. SMITH, M.D.
AND
ARLINE STEINMEYER, A.B.
ST. LOUIS

One of the interesting chapters in the medical history of this country is that concerning the mysterious disease known as milk sickness. In the pioneer days it caused an appalling loss of human life. Some outbreaks swept away a fourth of the population. History and tradition indicate that entire communities were frequently abandoned in frantic fear of this plague. It was one of the serious problems of the early settlers and appears to have been a definite stumbling block to emigration. Since the middle of the last century there has been a marked decrease in the number of cases of milk sickness until today it is relatively rare and few physicians have any first-hand knowledge of the disease. The rarity of the disease in important medical centers, both past and present, probably accounts for the lack of appreciation of its historical importance.

This condition in human beings has always been accompanied by an equally puzzling ailment in domestic animals, called trembles. A connection between the two was readily traced to the use of milk from affected cattle; hence the name "milk sickness." It is now well established that the disease is caused by the ingestion of milk from cows feeding on white snakeroot (*Eupatorium urticaefolium*). An apparently identical disease in the Southwest is caused by the rayless goldenrod (*Aplopappus heterophyllus*). The decreased incidence of the disease is undoubtedly due to the clearing of the lands, which thus provides better grazing conditions for cattle. The disease still occurs sporadically and recent outbreaks have stimulated an increased interest in this perplexing problem.

The clinical manifestations of milk sickness might be pictured as follows: In the early stages there is a restless, weak, exhausted feeling with increasing anorexia. In the mild cases little more than this is experienced.

* From the Department of Internal Medicine, Washington University School of Medicine.

Later, perhaps after a few days, there is marked anorexia, nausea and vomiting. Extreme weakness and indifference soon dominate the picture. Intense thirst prevails. The bowels are obstinately constipated; peristalsis seems suspended. There is a weak pulse, labored respiration, subnormal temperature and sometimes enlargement of the liver. Observers have repeatedly noted the swollen, tremulous tongue. Death is often preceded by prolonged coma. Convulsions occur in both human cases and animals. Death may ensue in two or three days; more often it occurs in from one to two weeks. In many instances those who apparently recover linger for months or even years with health seriously impaired and an incapacity for hard work, especially in warm weather. One of the striking features of the disease is the liability to recurrence of symptoms. Fasting or undue exertion may transform a mild case into a serious and perhaps rapidly fatal form. In earlier days the incapacity to bear exercise was used to diagnose the latent condition in animals. It was customary to give cattle a hard drive before purchasing them; those affected would immediately develop acute trembles.

Preliminary experiments on animals poisoned by this plant have indicated that such studies present a new field for the investigation of ketosis and of carbohydrate and fat metabolism. They also suggest the cause of certain clinical features of milk sickness and indicate rational treatment of this mysterious malady.

Fig. 1.—Representative specimens of Eupatorium urticaefolium. It is usually more branched than indicated here. The blossoms in the upper illustration are slightly less than natural size.

Even in the earliest descriptions of milk sickness and trembles a characteristic sweetish odor to the breath was described and even stated to be diagnostic. Walsh [1] in 1909 demonstrated a positive ferric chloride reaction in the urine, and at about the same time Woodyatt [2] proved the presence of acetone. Couch [3] has recently shown that the quantity of acetone excreted by animals with trembles is very great. This is especially interesting since ordinarily it is impossible to produce more than a slight ketosis in the lower animals, in striking contrast to man and some of the other primates. In numerous experiments on animals we have confirmed this finding of a marked ketosis. Fasting rabbits will produce little more than a trace of acetone, but when poisoned by this eupatorium they will present a marked acetonemia and acetonuria.

Fig. 2.—A typical habitat of Eupatorium urticaefolium.

In figure 1 are some representative specimens of the plant. Figure 2 is a good illustration of its habitat. It grows in woodlands and deep valleys, and thrives especially where shade is abundant. In the wood that is pictured, our most toxic specimens were obtained. Two years ago, out of a family of six using milk from cows

TABLE 1.—*Blood Sugar Observations on Rabbits*

Before Administration E. Urticaefolium, Mg. per 100 Cc.		During Administration of E. Urticaefolium				
		Not Ill, Mg. per 100 Cc.		Obviously Ill Mg. per 100 Cc.		
142	126	159	126	190	84	53
139	123	154	126	151	83	52
139	125	152	120	146	77	49
135	124	146	119	127	73	45
133	122	145	119	121	69	41
131	122	145	116	115	66	41
131	118	133	113	106	63	39
129	113	129	112	103	63	39
128	110	127		98	63	37
127				88	59	26

1. Walsh, W. R.: Illinois M. J. **15**: 422, 1909.

2. Woodyatt, cited by Jordon, E. O., and Harris, N. M.: J. Infect. Dis. **6**: 401, 1909.

3. Couch, J. F.: Science **64**: 456, 1926.

pastured in this wood, five died. The disastrous results that may follow exertion are illustrated by the case of the father, who was the least ill and had improved some-

TABLE 2.—*Blood Sugar Tolerance Curves of Rabbits During Administration of Eupatorium Urticaefolium*

	Not Ill			Obviously Ill					
Fasting	139	126	158	138	97	116	106	113	128
½ hour	263	190		233	245 *	296	83	111	226
1 hour	223	140	160	181	229	263	83	113	145
2 hours	144	119	150	153	130	185	78	98	145
3 hours	132	120	153	148	108	90	41	57	129
5 hours		106		.....	.....	.....		53	
24 hours	.....	.....	.....	.....	.....	.....	.....	.....	73
30 hours	.....	.....	.....	.....	.....	.....	.....	.....	68

what, and felt that his farm work should be resumed. He got up and plowed. That night he became much worse and died the following day.

Quite unexpectedly we found that a prominent feature of the illness in our experimental animals was the development of hypoglycemia, death frequently resulting with hypoglycemic convulsions. In table 1 are listed the blood sugar determinations made on rabbits poisoned with white snakeroot. When the animals were obviously sick, hypoglycemia was almost the rule. Hyperglycemia was occasionally encountered. When the rabbits received white snakeroot but were not sick, no change has been observed in the blood sugar except occasionally slight hyperglycemia.

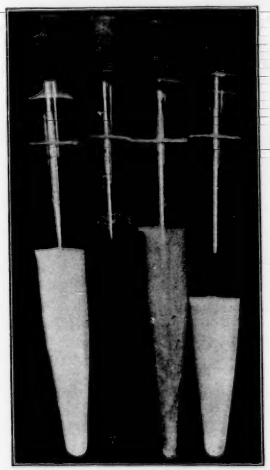

Fig. 3.—Lipemia, which may be found in white snake root intoxication.

In table 2 are some examples of blood sugar tolerance curves of animals receiving white snakeroot with their food. As a rule, little variation from the normal has been observed, as illustrated by the first six curves. The third is high and flat. Even with marked intoxication there may be no certain change, as indicated by the fourth, fifth and sixth. But the last three illustrate a very interesting response; in the first, hypoglycemic convulsions and death occurred in three hours; in the second, in five hours. The animal giving the last curve was not very ill. The fasting blood sugar was normal and the curve was quite normal. Twenty-four hours later the animal was moribund with a blood sugar of 73. At this time it was given 12 Gm. of dextrose (the equivalent of nearly half a pound for an average man). Yet six hours later it died in hypoglycemic convulsions.

Another manifestation of intoxication by white snakeroot is a lipemia, which may be extreme, as illustrated in figure 3. It might be stated that the characteristic pathologic manifestation of the condition is a marked fatty degeneration of the parenchymatous organs and muscles.

Ketosis and hypoglycemia may appear as early as two days after the administration of white snakeroot. The interval is usually longer, however, and depends on the toxicity of the particular specimen and the rapidity with which the animal will take it. Ketosis and hypoglycemia are not invariably associated. Ketosis has been observed with a normal blood sugar and an absence of acetonuria with a low blood sugar. But such observations are rare exceptions. The lipemia is preceded by ketosis. A notable feature has been the exceedingly rapid loss of weight, which did not start until evidence of intoxication appeared and averaged about 5 per cent of the body weight each twenty-four hours. Yet nitrogen metabolism has not been markedly increased. Another interesting feature has been the condition of the eyes: a lusterless, injected sclera with a whitish discharge which becomes gummed to the canthi and the lid margins. Although not uniformly present this may appear even before ketosis is manifest. There are a few notes in the literature suggesting a similar condition in other animals and man.

The possible relationship of hypoglycemia to the more acute symptoms of milk sickness seems obvious; the fatigue, the rapid recurrence of symptoms following exertion, the coma and occasional convulsion. We find references in the literature to the rapid development of serious symptoms in mild cases if the taking of food is delayed beyond the usual time.

After dextrose had been given to poisoned animals, acetone usually cleared rapidly and there was marked improvement. If this was followed by a high carbohydrate diet, the animal was rapidly restored to health. The reactions of the experimental animals certainly suggest an effective treatment of milk sickness. They indicate that the proper administration of carbohydrate would be attended by the prompt alleviation of symptoms. In the presence of vomiting, the intravenous administration of dextrose would almost be imperative.

SUMMARY

Disturbances in the metabolism of animals produced by white snakeroot suggest the cause of certain clinical features of milk sickness and indicate rational treatment of this disease. There is a marked ketosis, a lipemia and a tendency toward a profound hypoglycemia. The proper administration of carbohydrate should be attended by a prompt alleviation of symptoms.

Spectacles Among the Ancients.—Two French writers have recently stated that when Marco Polo penetrated China in 1270 the inhabitants were wearing lunettes. Horner says that the only people of antiquity who may have used spectacles are the Chinese, and Pansier, too, thinks this possible; but neither presents any evidence in support of his statement. Inquiries on the part of others show that there is no trace of evidence that the Chinese used glasses in the Middle Ages. As far as can be ascertained, there is nothing in the writings of the ancient Jews showing that they had a knowledge of spectacles. We can say with certainty that the Greeks and Romans of antiquity knew nothing about them; that is of lenses with long focus, nor have excavations revealed anything of the kind. The great European collections contain nothing like our spectacles, but various references are made to convex lenses made of glass or rock crystal, which have been been found in different places, such as Nola, Mayence, Pompeii, Nineveh and in England. These were not used as spectacles, as they have too short a focus and we can only conjecture their use; perhaps they served as magnifying and burning glasses.—Smith, E. T.: The History of Spectacles, *M. J. Australia*, Nov. 10, 1928.

THE TREATMENT OF ACUTE EMPYEMA COMPLICATED WITH A BRONCHIAL FISTULA

USE OF THE CLOSED METHOD *

RALPH B. BETTMAN, M.D.
AND
NATHAN N. CROHN, M.D.
CHICAGO

Bronchial fistula complicating acute empyema occurs more frequently than is usually supposed. The incidence varies from season to season but occurs in about 10 per cent of all our cases. It is more frequent in children than in adults. There seems to be no relationship between the occurrence of fistula and the type of bacteria or the side of the chest involved. It is more apt to occur in intralobar empyema than otherwise. Our late cases showed a greater percentage of bronchial fistula than our early cases. The symptoms are the same as those of empyema itself except that frequently a loose cough is present which, in older children and adults from whom sputum can be obtained, is productive, containing, besides mucus, definite pus. The roentgenogram, if it is taken in the upright position, as all roentgenograms of the chest should be taken, may show the pathognomonic fluid line. Sometimes the temperature is lower and there is less flatness on percussion than usual, and occasionally on auscultation signs similar to those of a cavity are heard.

The establishment of a bronchial fistula is one of the two methods by which nature occasionally cures empyema thoracis. In cases in which for various reasons artificial drainage has not been instituted, frequently there has been successful drainage through the spontaneous occurrence of a bronchial fistula. We feel sure that in many undiagnosed cases of empyema the patients get well in just this manner. As a rule, however, the bronchial fistula does not offer sufficient drainage, and unless the empyema cavity is artificially drained the result is a chronic empyema with the lung bound down by adhesions in various degrees of collapse. Occasionally bronchial fistula ends in death because of the establishment of a pressure pneumothorax resulting from a valve action which allows air to be sucked into the pleural cavity during inspiration but does not allow the air to be expressed during expiration.

Artificial drainage is indicated in the vast majority of cases of bronchial fistula. Artificial drainage is always indicated when the condition has not cleared up within ten days or two weeks after the development of the bronchial fistula. The danger of the formation of adhesions that will bind down the lung and thus prevent subsequent expansions and obliteration of the empyema cavity is too great to counterbalance the inconvenience of artificial drainage. A patient with empyema is never cured until the empyema cavity has been obliterated and the major part of this obliteration is taken care of by the reexpansion of the lung. Therefore the formation of adhesions that might prevent this reexpansion should be avoided lest a chronic empyema develop. In the great majority of cases the bronchial fistula closes spontaneously within a few days after artificial drainage has been established. Therefore the reasons that have caused surgeons to substitute closed drainage for open drainage in empyema are equally applicable in cases of bronchial fistula. By means of closed drainage the negative pressure in the pleural cavity is reestablished as soon as the bronchial fistula is healed, and with the reestablishment of negative pressure reexpansion of the lung occurs.

In artificial drainage by the closed method in the presence of a bronchial fistula, allowances must be made for two conditions which otherwise can be disregarded. The first is that the development of a pressure pneumothorax must be guarded against and the second is that the cavity cannot be irrigated without producing violent paroxysms of coughing. Our method of treating cases of acute empyema complicated by bronchial fistula differs from that which we usually use in uncomplicated cases in the following manner: After the drainage tube (catheter) has been inserted into the empyema cavity by means of a trocar as usual, the end of the catheter is attached to a long rubber tubing which courses over the bed and then drops down into a bottle in such a way that the end of the tubing is submerged in surgical solution of chlorinated soda or some other deodorant. In this way there is a constant opening for the escape of pus and air from the empyema cavity and yet there is no opportunity for the ingress of air. The pus readily flows out through the catheter and tube into the bottle, and during each expiration air which may have been sucked in through the fistula into the empyema space bubbles forth from the end of the tubing. After a short time, varying from a few hours to a few days, the bronchial fistula usually closes and no more bubbles are seen. The outflow of pus into the tube thereupon quickly establishes a negative pressure, the amount of which can be varied by lifting or lowering the bottle.

Closed method of drainage of bronchial fistula in acute empyema.

We purposely do not attach our drainage tube to one of the various suction devices which have been described because we feel that the bronchial fistula will close much more quickly at a neutral pressure than at a negative pressure. After the fistula has closed, the pleural cavity can be irrigated without fear of producing paroxysms of coughing. For this reason a Y tube is incorporated in the drainage system in such a way that surgical solution of chlorinated soda can be instilled without disturbing the tubing. The irrigation of the pleural cavity with surgical solution of chlorinated soda is necessary in order to dissolve the thick inspissated pus. When the patient is able to sit in a wheel chair the bottle is attached to it, and later, after the patient becomes ambulatory, can be attached to a sling hung from the shoulder and held by strapping against the

* From the Surgical Service of Michael Reese Hospital.

trunk or thigh. The duration of treatment in our cases has been no longer in those complicated with bronchial fistula than in similar uncomplicated cases.

We are especially desirous of reporting this simple method of treatment because many surgeons who otherwise use the closed method of drainage in acute empyema still feel that in the presence of a bronchial fistula the archaic method of rib resection must be resorted to. This is far from the fact.

SUMMARY

1. A bronchial fistula that occurs in actual pleural empyema almost invariably closes after artificial drainage has been established.
2. Allowance can be made for the escape of pus and air from the pleural cavity and yet the consequences resulting from an artificial open pneumothorax can be prevented.
3. The closed method of drainage is just as desirable in cases complicated with bronchial fistula as in the uncomplicated cases of acute empyema.

THE PRINCIPLES OF TREATMENT OF STONE IN THE BLADDER *

HUGH CABOT, M.D.
ANN ARBOR, MICH.

In discussing the underlying principles that should influence the treatment of stone in the bladder it has been customary to distinguish between primary and secondary stones. A study of the literature, however, shows that these words used in this connection do not have a constant meaning and that confusion has thus

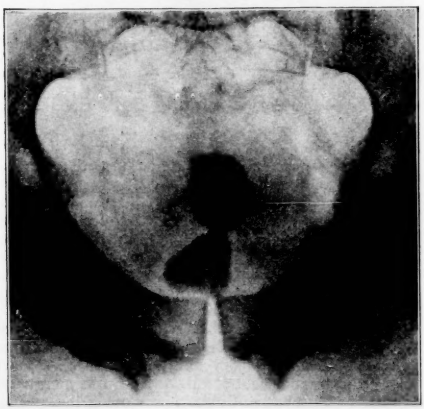

Fig. 1.—The stone near the symphysis lay in the cavity from which the prostate had been removed.

resulted. For instance, if the word "primary" stone in the bladder is used as it is used by many authors to mean all stones that originate in the bladder, then one set of deductions will be proper. If, on the other hand, it is used in a sense which is on the whole more common in usage to mean that the formation of stone is not dependent on any other abnormality of the bladder, then a very different set of conclusions will be required. It has seemed to me that it would be an aid to clear and accurate thinking if the phrases "complicated" and "uncomplicated" were employed to cover the same general field. In this article, therefore, I shall divide the discussion of the subject into the treatment of "com-

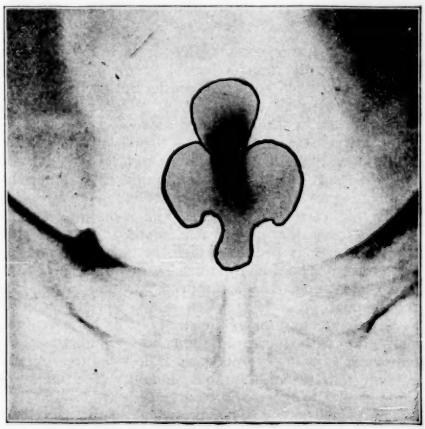

Fig. 2.—Outline of stone has been inked to show its peculiar shape.

plicated" stones in the bladder, meaning by this phrase that the stone is associated with some other condition of the bladder which in and of itself requires treatment, and "uncomplicated" stone in the bladder, which will be held to mean those stones, whether originating in the bladder or coming from the upper urinary tract, in which there is no other condition of the bladder that in and of itself requires surgical treatment.

TREATMENT OF COMPLICATED STONE IN THE BLADDER

The group of complicated stone in the bladder by definition includes all those cases in which the bladder is the seat of some other condition requiring surgical treatment. In the days when the operation of litholapaxy was first introduced, more than forty years ago, a large number and probably a majority of the patients in whom it was employed had some form of obstruction to the bladder outlet. Many of them were subjects of prostatic obstruction. The development of modern surgery has removed this group largely though not entirely from the proper scope of the operation of litholapaxy. This has resulted from the development of satisfactory methods of treating prostatic obstruction, and today the stone becomes a secondary consideration in the plan of attack on the obstruction. To the same group belong a certain number of cases in which the stone developed in a diverticulum and was later extruded into the bladder so that it became accessible to instruments and could be dealt with by litholapaxy. Today one should not regard the removal of the stone under these circumstances as constituting sound treatment and should properly take the view that, as the conditions existing in the bladder on account of the diverticulum were essential in the formation of the

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stone, the diverticulum and not the stone should be the primary subject of attack. Here again modern surgical methods have enabled us to deal with the diverticulum satisfactorily and the stone, therefore, becomes a secondary consideration.

These two examples will serve to show what is meant by the subdivision of the field in this way and it may, I think, be laid down as a fundamental principle that in the study of a patient with stone in the bladder preliminary to the decisions of the best method of attack, such study should have as its essential purpose the decision of whether or not there exists in the bladder some condition other than stone which requires surgical treatment. If such a condition is found, whether obstruction, diverticulum, tumor or other abnormality, then the treatment of the stone becomes a consideration secondary to that of the other lesion. The application of this principle will limit largely the group of cases in which the stone itself is the primary consideration.

TREATMENT OF UNCOMPLICATED STONE IN THE BLADDER

According to the definition of the phrase as stated, it will be seen that the group of uncomplicated stone in the bladder under modern conditions is really the group of cases in which the treatment of stone in the bladder as a primary objective can be properly considered. Stone in the bladder may be treated by one of two methods: It may be removed by incision, or removed by crushing and evacuation by instruments. For the latter method the term "litholapaxy," as coined by Oliver Wendell Holmes for Henry J. Bigelow, will be used. In considering any method of treatment, the advantage to the patient must always be the prime consideration. No extended argument will be needed to show that litholapaxy is a method always in the interests of the patients when it can be satisfactorily carried out. This point appears to me to have been settled beyond question by the experience of the last forty years, and I see no reason to disagree with the opinion expressed by the late Edward L. Keyes more than thirty years ago that the experience of the Indian surgeons, who today treat more stones in the bladder than most of the rest of the civilized world put together, is satisfactorily controlling on this point. Their testimony is unanimously in favor of litholapaxy, with the limitation stated. The shortened convalescence, the lesser insult to the patient and the avoidance of suprapubic scars which may complicate and render more difficult of access any future lesions which the patient may have in the bladder are the fundamental considerations in this conclusion.

I come, therefore, by the process of exclusion to a consideration of the limitations of the operation of litholapaxy. By the term "litholapaxy" I intend to include not only the methods originally put forward by Bigelow and which were extraordinarily complete for his day, but also the additions and improvements which have come as the result of the development of the cystoscope.

CONTRAINDICATIONS TO LITHOLAPAXY

1. Disproportion between the size of the stone and the capacity of the bladder. This was a contraindication originally laid down by Bigelow and it will always continue to exist. There is obviously a group of cases in which a large stone lies in a more or less contracted bladder. Here the movements of the instrument are necessarily limited; the amount of trauma resulting from many fragments is considerable and the time necessarily consumed in the operation, even if it can be successfully carried out, is to the disadvantage of the patient. It will be noted that this contraindication is variable and will be influenced by the general condition of the patient and the skill and experience of the surgeon. In general it is safe to suggest that a bladder that holds less than 125 cc. and contains a stone of considerable size will not be suitable for litholapaxy. Great skill and experience on the part of the surgeon may definitely modify this statement.

2. Stone having as its nucleus a foreign body that cannot be crushed. This again was one of the original contraindications laid down by Bigelow and resulted chiefly from the occurrence in his day of a certain number of cases in which a lead bullet received by the individual during the Civil War had become the nucleus of a stone and defied crushing. This contraindication was a more troublesome one in the days previous to the development of roentgenology, since the nature of the foreign body could not be determined with certainty previous to operation. Today it is fairly safe to limit the contraindication to those stones which have as their nucleus a metallic foreign body. Of these, perhaps the majority will be pins that have reached the bladder by some unusual method, and perhaps a small number of shell fragments from the late war. Other foreign bodies need not constitute an absolute contraindication. For instance, I have seen a considerable number of cases of stone having as their foreign body nucleus a piece of chewing gum or bougie of some material which does not absorb in the urine. These stones can be satisfactorily dealt with by litholapaxy and do not constitute a contraindication.

Another not rare group is those stones which form about a fragment of catheter that has been inadvertently lost in the bladder. In such a situation, litholapaxy may or may not be a proper operation. If the amount of catheter is large or if it is of considerable diameter as, for instance, the terminal end of a so-called Pezzar catheter, then the amount of rubber will be so great that it cannot be properly evacuated and will constitute a contraindication. If, on the other hand, the amount of catheter is small or if after the stone is crushed it can be seized by the lithotrite and drawn through the urethra without undue trauma, then it will not constitute a contraindication. Clearly in this group the skill and experience of the surgeon will play a considerable part.

3. Patients in whom the instruments necessary for litholapaxy cannot be passed through the urethra. This again was one of the original contraindications laid down by Bigelow. In his day it applied chiefly to patients with stricture of the urethra but should be extended to include children in whom the disproportion between the size of the instrument and the caliber of the urethra is a bar. Today stricture of the urethra should not be regarded as a contraindication, since the stricture can be readily divided by internal urethrotomy, external urethrotomy or both and the operation then carried out either through the urethra or through the perineal wound. I am inclined to stress this point since I think that, in patients with stricture prohibiting the passing of the lithotrite, multiple operations such as are involved in treatment of the stricture and removal of the stone by suprapubic cystotomy are distinctly undesirable. The limitation as to children is probably less absolute than it was in Bigelow's day, though there were early developed relatively small instruments and the Indian Medical Service has crushed many hundreds of stones in children. Another phase of this contra-

indication which has been somewhat modified by modern surgery was that concerning itself with patients having ankylosis of the hip in such a position that the lithotrite could not be introduced or, if introduced, could not be manipulated. Today it would properly be regarded as good surgery to return the ankylosed hip to a more normal position by operation as the result of which procedure litholapaxy would become feasible.

It will now be seen that the contraindications stated, which cover, I think, a majority of the situations which will in fact face the conscientious surgeon do not involve a majority of the patients with uncomplicated stone in the bladder. It therefore appears to me to follow that in this group the vast majority should be treated by litholapaxy. I am of the opinion, however, that this is not the average practice today and that probably more than half of the uncomplicated stones in the bladder are dealt with by a suprapubic operation. I cannot bring myself to regard this as sound practice since it appears to me to disregard the very clear advantage of the patient and I believe the suprapubic method is commonly employed not because it is in the best interests of the patient but because it is the operation with which the surgeon is familiar. I need not press the point that this is not sound surgical morals and that those who find themselves in this ethical predicament will do well to look carefully to the condition of their surgical conscience.

There is a group of borderline cases to which I will refer in closing. They include some of the cases in which the stone has as its nucleus a foreign body and a group of cases in which the stone lies not in the bladder but in a more or less dilated prostatic urethra. In the first instance, that of the foreign nucleus which is not metallic but which may for instance consist of a fragment of catheter, the conscientious surgeon may hesitate to apply litholapaxy for fear that he may be unable to carry the operation through to a satisfactory conclusion. In this dilemma he may, after careful consideration, decide on the suprapubic method of attack; but I think the decision is often made without sufficiently careful balancing of the alternatives. I cannot see any sound objection to admitting at the start that it may not be possible to deal satisfactorily with the situation by a litholapaxy, but this need not deter the surgeon from attempting it. If he should find that the operation is not going to be satisfactory, he may then open the bladder above the pubes without removing his lithotrite and leave his patient in exactly as satisfactory a condition as if the suprapubic method of approach had been selected. By this method the patient will, in my judgment, be given the soundest benefit of the doubt, and in many cases a successful litholapaxy will be accomplished.

In regard to the second group of cases, it has been generally assumed that a stone which did not lie in the bladder could not be dealt with by litholapaxy. In recent years my experience has led me to doubt the soundness of that conclusion since I have successfully dealt with several cases of stone in the prostate by litholapaxy. In two recent cases which will serve as illustrations, stones more than 2 cm. in length and 1 cm. in width were found to lie in the prostatic urethra. In one, the stone was somewhat triangular (fig. 1). In the other, its central portion showed a flange which lay in the widest diameter of the prostatic cavity and prevented the stone from moving backward into the bladder (fig. 2). In both of these cases it was found possible, by the introduction of a sound into the urethra and the finger of the left hand into the rectum, either to break the stone without injury to the prostate or to push it backward into the bladder. In both of these cases, litholapaxy was then successfully carried out and the short and satisfactory convalescence associated with that operation resulted.

I submit, therefore, that a certain number of patients with prostatic calculus of considerable size lying free in a distended prostatic urethra may be considered as possibly satisfactory subjects for litholapaxy.

University Hospital.

CALCULOUS ANURIA*

GEORGE F. CAHILL, M.D.
AND
HAROLD H. GILE, M.D.
NEW YORK

Anuria due to calculous disease occurs under the following circumstances:

1. Two secreting kidneys may have both ureters or pelves blocked simultaneously, either synchronously or one following the other.

2. A single secreting kidney may be blocked, the other (*a*) being imperfectly developed, or (*b*) having been destroyed by disease, or (*c*) having been previously removed.

3. Both kidneys or a double kidney may have a fused single ureter which may be blocked by a calculus.

4. Two kidneys apparently normal may have one kidney blocked and the other failing to secrete reflexly, the so-called renorenal reflex block.

REPORT OF CASES

CASE 1.—A stout woman, aged 66, was anuric for six days and had intermittent pains in both flanks. She had been diabetic for ten years. Otherwise she was comfortable and rational. The blood pressure was 150 systolic and 70 diastolic. Roentgenograms were negative for shadows of calculi. Cystoscopy and pyelography on the seventh day of anuria showed a dilated left pelvis and the right ureter blocked at the ureteropelvic junction. No urinary secretion was obtained from either side. Expectant treatment did not produce any urine. On the sixth day the blood urea was 209 mg. per liter and on the seventh day 260 mg. The creatinine was 10.9 mg. A bilateral nephrostomy was done on the seventh day with removal of the calculi that were blocking the pelves. This was followed by rapid recovery. On the second day after operation the blood urea was 225 mg. and dropped gradually until it remained at 25 mg., reaching that on the fifteenth day.

CASE 2.—A girl, aged 17, was admitted with right-sided colicky pains of six days' duration and anuria of three days' duration. She was very drowsy and had edema of the face. The roentgenograms were negative for shadows of calculi. A cystoscopy and pyelograms showed a blocked right midureter and an aplastic left kidney. Following cystoscopy, the patient developed convulsions and became almost totally blind. Ophthalmoscopic examination showed marked fundal edema. The blood urea was 230 mg. per liter. A nephrotomy was done on the right kidney, followed by a rapid recovery. Vision returned and the blood urea dropped the second day to 153 mg., the fourth day to 48 mg. and reached 21 mg. on the fifteenth day. Cystoscopy with ureterograms showed a lowering of the obstruction down the ureter and no obstruction on the twelfth day. No calculi were recovered from the voided urine. On the twenty-eighth day after operation, phenolsulphonphthalein secretion was normal in a two hour test.

CASE 3.—A man, aged 52, an engineer, with a history of a left calculous pyonephrosis for twelve years and a right renal

* From the J. B. Squier Urologic Clinic, Columbia University College Physicians and Surgeons.

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calculus for two years, had pyuria for months and was anuric for twelve days following a right sided colic. X-ray examination showed the shadow of a small right pelvic calculus and a large left pelvic calculus. The right kidney was very large and the left one small. He was emaciated and stuporous and the bladder contained a few drops of pus. The blood urea was 280 mg. per liter. A nephrotomy was done and a calculus removed from a large right pyonephrotic kidney. The patient died thirty hours after the operation.

CASE 4.—A stout man, aged 36, had pain in the right flank and was anuric for thirty-eight hours. He had had a left nephrectomy for calculous pyonephrosis one year previously. Six months previously he had had a right renal calculus removed after an anuria of three days. The blood urea was 78 mg. per liter. The roentgenograms were unsatisfactory in showing a renal calculus. A nephrotomy was done and a soft calculus removed from the right renal pelvis. The patient made an uneventful recovery and the blood urea reached 18 mg. on the tenth day.

CASE 5.—A stout man, aged 47, a fireman, had pain in the right side and was anuric for forty-two hours. A right renal calculus had been removed six years previously and the left kidney removed one year previously for a calculous pyonephrosis. He was drowsy. The blood urea was 52 mg. per liter. X-ray examination showed a small calculus near the vesicoureteral junction. The ureter was dilated through a cystoscope and the small impacted calculus was dislodged and removed. On the third day the blood urea had fallen to 12.6 mg.

CASE 6.—A man, aged 32, a clerk, had pain in the right flank and hematuria of six days' duration. Cystoscopy revealed the right ureter blocked about 2 inches from the bladder. The roentgenograms were negative for shadows of calculi. The left kidney secreted normal urine. Following attempts to pass the obstruction, a chill and a high fever developed. Within three days the patient became stuporous and was anuric for forty hours. The blood urea was 126 mg. He began to have muscle twitchings. A right nephrotomy and drainage was followed by immediate improvement and a return of secretion from the left kidney. The blood urea fell gradually, reaching 64 mg. on the sixth day and 35 mg. on the sixteenth day. The patient had two severe postoperative hemorrhages from the nephrotomized kidney that necessitated transfusions. Recovery was then rapid and cystoscopy later showed normal secreting kidneys and no obstruction to the ureter. No calculi were recovered in voided specimens.

CASE 7.—A man, aged 45, a barber, was anuric for five days, with pain in the left side. The right kidney had been removed six years previously for calculous pyonephrosis. Five months previously he had had a large branching calculus removed from the only kidney followed by a stormy convalescence, necessitating transfusions for hemorrhage from the incised kidney. On admission x-ray examination was negative for calculi. Cystoscopy and ureterograms showed block of the ureter near the pelvis. A nephrotomy was done on the fifth day of anuria. Thick, gritty pus was removed from the renal pelvis. The blood urea was 78 mg. on the fifth day. No urine was secreted until the seventh day, the urea rising to 106 mg. Profuse drainage then occurred and the patient made a good recovery. The urea fell every forty-eight hours after operation as follows: 85 mg., 53 mg., 32 mg.

COMMENT

The earliest operation in a case of anuria was performed by Guermonprez in 1870. The next operation was by Bardenheuer in 1882 with a pyelotomy incision. In 1884, Morris attempted to remove a calculus in the lower ureter through perineal ureterotomy. Israel, in 1885, successfully removed calculi from the renal pelvis for anuria through a lumbar incision. Following a series of studies in the succeeding years by Legueu, Donnadieu, Vailhen and Glantenay, a number of cases have been reported. Watson and Cunningham collected reports of 205 cases up to 1907. Since then single cases have been listed, to which is added our study of seven.

The majority of cases occur in the middle aged. The condition is comparatively rare in children. The ages of our present patients are 17, 32, 36, 45, 47, 52 and 66 years. It occurs more commonly in the male than in the female. Statistics show the proportion of 5 to 2. In the seven cases that we are presenting, previous calculus was present in four and absent in three.

The characteristic symptoms are pain and anuria. Pain was present in all our cases, although in one pain was transitory and was not revealed until brought out by insistent questioning. Next to anuria, pain is the most prominent symptom.

The course of the condition is usually described as a period of tolerance and a period of uremia. The tolerant period, coming, first, is of variable duration. The patient is clear mentally, has dry skin, and is comfortable with the exception of the renal colic, when present. The tongue is heavily coated, and a slight nausea exists with a dislike for food. Sleeplessness was complained of in all cases, and gaseous distention of the intestinal tract was present. When hydronephrosis or a previous infection or disturbance of the kidneys exists, the period of tolerance is greatly prolonged. Cases of more than twenty days' tolerance have been reported in the literature. Analysis of the constituents of the blood show a retention of the usually excreted substances, the amount varying with the duration of the block. The amount of retention of these products does not appear to be the cause of the toxemic or uremic period. The carbon dioxide coefficient was lower than normal. In the present reported cases the lowest was 0.32 but clinically the case was symptomless for either uremia or acidosis.

The uremic period followed the period of tolerance when the block was not relieved. Three of our patients had uremic symptoms; two of these, the youngest individuals, were free from previous disease and in each the tolerant period was short, three and two days, respectively. The uremic symptoms were drowsiness, with nausea and some vomiting and slight edema of the eyes. There were twitchings and in one case convulsions. Blindness to all but light and very large objects in one case was attributable to fundal edema as shown by the ophthalmoscope. The uremic stage in one case was terminal.

Recent investigations as to the cause of muscular twitchings and convulsions in patients with uremia show that there is a marked fall in the calcium and phosphorus contents of the blood. Unfortunately, we were unaware of their importance and have no investigations concerning this phase in these cases.

The blood pressure readings were little raised in any case from the normal. In the convulsive case the readings were generally 110 systolic and 60 diastolic.

Diagnostically, the history of pain with anuria was the most important symptom. The last affected or single blocked kidneys were usually enlarged and tender.

In only three cases did our ordinary roentgenographic films show shadows sufficiently characteristic of calculus to form the basis of a diagnosis. All the films showed a profuse gaseous distention of the intestinal tract which made roentgenographic interpretation difficult.

Cystoscopy in conjunction with ureterograms or pyelograms was the most important diagnostic procedure. In one case there was a visible calculus blocking the ureterovesical orifice. In five cases there was no secretion obtained from the kidney, with an absolute block to the ureteral catheters. In two of the cases, in which no urine was excreted down the ureter, pyelographic

fluid could be introduced around the calculus up to the kidney. Mitry has reported a similar condition in a case of four days of anuria. The calculus completely blocked the ureter; valving to the flow of urine from above but was patent to fluid pressure from below. This phenomenon has been frequently seen in ureteral calculi, as has the reverse, in which urine escapes easily from above and is secreted into the bladder with the ureter entirely blocked to attempts to inject fluid from below the calculus up to the kidney.

The injection of radiopaque solutions past a valved stone apparently is not without danger if the fluid cannot be recovered. One patient developed convulsions and fundal edema shortly after the injection of a 12 per cent solution of sodium iodide past the valved stone.

With the exception of the case in which the calculus was extracted through a cystoscope, all of these patients were treated by the classic nephrotomy and drainage. The anesthesia of all was nitrous oxide and oxygen. The incision of all was by the lumbar route, none of the cases having presented calculi by x-ray examination in the lower ureter. Läwen reported a case of bilateral ureterolithotomy from the iliac portions of the ureter for anuria, but states that if the anuria is severe he would first recommend a double nephrotomy and drainage.

The kidneys were distended, tense, deep colored and with edema of the capsule. The nephrostomy incisions were made in the classic Hyrtl line as nearly as could be ascertained. The pelvis was rapidly opened and explored. The fluid in the pelvis was apparently always under pressure, in one case spurting several inches. The calculus was located and removed if possible, and the renal bleeding controlled by sutures. Drainage of the kidney was usually supplied by soft rubber sheeting rolled as a tube. In the cases in which the block was in the ureter, no attempts were made to isolate the ureter and to explore it in an endeavor to locate and remove the calculus. Relief of the obstruction by lumbar nephrotomy was achieved in all cases, and was followed by automatic relief of the obstruction below. In the case of bilateral obstruction of the pelves, the double nephrotomy and removal of the calculi were done at one sitting.

The change following the relief of obstruction was remarkable. Whereas the patients showed a dry skin and drowsiness, relief was immediately followed by profuse sweating and a rapid recovery from drowsiness with cessation from nausea and a return of thirst.

Secretion of urine did not immediately set in in one case until forty-eight hours following nephrotomy. During this period the blood urea was increased 35 mg. per liter. The drainage at the same time was sanguinopurulent. The nephrostomy tube was patent and there was no apparent reason for the slow pick up of the kidney.

Studies of the changes in the urea in the blood of these patients showed that the amount was usually determined by the duration of the anuria. When the obstruction was relieved, the urea was eliminated at first in an apparently regular rate; but as it approached normal, the proportionate amount diminished. The rates for case 7 are illustrative: The rise and drop of blood urea every forty-eight hours are: 73, 106, 86, 53, 33, 29, 26, 23.

The only postoperative complication was severe secondary hemorrhage from the incised kidney. This occurred twice in each of two cases. In case 6 on the fourth and eighth day, cultures from the draining wound in the case showed a hemolysing streptococcus. In case 7 the hemorrhage occurred on the tenth and seventeenth day after the first operation block. The second hemorrhage was followed by a small slough of material, evidently renal. These cases showed normal bleeding and clotting times. Direct transfusions immediately following the hemorrhage each time controlled the hemorrhage and the anemia.

The recovery of the secretion of the incised kidneys was watched by cystoscopic and by phenolsulphonphthalein tests. In the bilateral case there was a 50 per cent phenolsulphonphthalein test five weeks after operation. In the renorenal reflex case a 75 per cent phenolsulphonphthalein total secretion in two hours was obtained two months after operation and the urea secretion was almost equal from the two kidneys. In all but the fatal case 3 and case 7 the return to approximate normal occurred within two months. In case 7, the phenolsulphonphthalein showed a 12 per cent return in two months and 16 per cent in four months after operation.

It is uncertain as to whether case 6 is one of true renorenal reflex or a toxic suppression of the involved kidney. There have been no fatal cases of renorenal reflex block in the literature, and most writers suggest that the kidney will resume function again without intervention. It is impossible to state whether secretion would again occur after toxic suppression, as in our reported case.

We have reported a series of seven cases of calculous anuria showing the acute and the chronic type of blocking. The diagnosis is best made from the history with ureterograms or pyelograms, and nephrotomy offers the best immediate step to correct the anuria.

121 East Sixtieth Street—114 East Fifty-Fourth Street.

ABSTRACT OF DISCUSSION

ON PAPERS OF DR. CABOT AND DRS. CAHILL AND GILE

DR. ARTHUR L. CHUTE, Boston: In citing the conditions in which calculous anuria may occur, Drs. Cahill and Gile speak of the "renorenal reflex" as being a possibility. I feel that the "renorenal reflex" is probably a tradition that has come down from the days before catheterization of the ureter. I have seen a total anuria go on to a toxic condition demanding nephrotomy, following catheterization of a ureter from which the investigator told me he had obtained normal urine. The anuria in this case without a doubt was due to the trauma, and probably to the infection of catheterization. It is my opinion that conditions of this sort will account for practically all cases of "renorenal reflex." This series of cases gives a discouraging view of the relentlessness of the tendency to the formation of renal stone and our inability to cope with it. As to the diagnosis, we cannot lean on radiography to the extent that we usually can in cases of calculus. In making a diagnosis we must depend principally on anuria, accompanied with a history of recent pain in one side. If there is no sign of the toxic stage, cystoscopic study should be carried out. If toxicity is present, the kidney that has been tender or painful most recently should be exposed and incised through the cortex. For operation, gas-oxygen anesthesia has a great advantage over ether. Local or spinal anesthesia would be better still. As to Dr. Cabot's paper, while I have not cared for the classification of "primary" and "secondary," as applied to bladder stones, I do not feel sure that the terms "uncomplicated" or "complicated" are really going to be much better. In my opinion, any small stone of renal origin that reaches the bladder would be passed before it became of any considerable size unless there was a certain degree of obstruction at the bladder outlet. This degree of obstruction is insufficient to require operative treatment. I believe with Dr. Cabot that the "uncomplicated" stones of his classification should be removed by litholapaxy, with

probably an exception in the case of the very large ones. In the cases in which bladder stones are present in combination with obstruction at the bladder outlet, or with diverticulum formation, the treatment of the stone will be secondary to that of the other condition and will usually be by cystostomy. The treatment of stones in infected bladders is not so clear. There are a certain number of stones in infected bladders in which I believe the infection has been secondary to the stone, and these, too, should be given the advantage of litholapaxy. The treatment, however, of most of the stones in infected bladders will be a part of the treatment of the underlying condition, and often not litholapaxy.

DR. ABRAHAM RAVICH, Brooklyn: Dr. Cabot's handling of the problem of bladder stones is particularly interesting to me because of the new lithotriptoscope which I recently devised. The prolonged and frequently nerve-racking litholapaxy with the old Bigelow lithotrite always seemed cruel, and at times leads to death from perforation of the bladder. I began to investigate this problem about eight years ago, and had a cystoscopic lithotrite made for me patterned after Young's cystoscopic lithotrite; but after crushing several stones I encountered one that caused the hollow shaft to break and I had to cut down to take out the stone as well as the fragments of the instrument. Then I devised a combination cautery punch and lithotrite equipped with a McCarthy fore-oblique lens and irrigation. Owing to certain difficulties and shortcomings, this instrument was discarded and a new one was devised by me about five months ago. With this instrument, litholapaxies can be safely and speedily done in complicated cases as well as in patients who either refuse operation or are poor operative risks. Fairly large hard stones can be safely bitten or crushed to pieces within fifteen or twenty minutes. Multiple stones and stones in contracted and other pathologic bladders can also be crushed with little trouble. Collection of débris between the jaws, preventing closure, can be prevented by a rapid to and fro motion with the pistol handle. The bladder, stone and jaws are always under vision and the bladder wall, therefore, cannot be caught. Continuous irrigation keeps the field of vision clear. After the stone is crushed the McCarthy lens is withdrawn, a Young evacuator is attached and the fragments are aspirated. The important advantages of this new instrument are: complete maintenance of the full strength and ruggedness of the old Bigelow lithotrite; moderate caliber; clear vision at all times as the result of continuous irrigation, and accomplishment of the entire operation through the one instrument. With such an instrument the field and indications for litholapaxy can be materially increased.

DR. R. ARTHUR HOOE, Washington, D. C.: Is it not true, Dr. Cabot, that a considerable number of others fall into the group of those who cannot tolerate instrumentation; namely, the highly developed neurotic individual? The occasional patient would seem to fall into this group. Last fall, a physician, aged 65, who had been treated by me some years previously for prostatitis and seminal vesiculitis, returned with somewhat similar symptoms, and with frequency and difficulty of urination, pus being found in the secretion. He was treated as previously for a reasonable period of time with only slight improvement. It developed that in the course of that treatment, if he would go out and play nine holes of golf, he would return with definite hematuria. It had been proved that he could not stand any kind of instrumentation. Even a mild solution of potash passed into the bladder would be followed by a definite reaction. Further investigation being clearly indicated, he was referred to the roentgen-ray department for study. A definite shadow was found in the bladder. Suprapubic operation was done and the stone removed. At the same time, a very definite intravesical prostate was discovered. A tube was inserted and ten days later the prostate was removed with little difficulty. There was a marked tendency to hemorrhage, which was controlled by packing with gauze. Within the week the patient developed a septic embolus, as we thought, in the lung and became desperately ill. We called Dr. Keller of Walter Reed Hospital and after much watchful waiting a thoracotomy was done by Dr. Kerr. Much gangrenous lung was removed and a liter of pus was aspirated from the pleural cavity. After a stormy convalescence he recovered, only to go to the hospital a month later for operation on the mastoid. Today he is apparently well. This case seems to represent well the type seen occasionally that cannot tolerate instrumentation.

DR. A. E. MACKAY, Portland, Ore.: I agree with Dr. Cabot that litholapaxy is the operation of choice. I believe most of my patients are referred to me with the advice that I can remove stones without operation, but I think we should hedge a little on this for I have found that on one occasion the lithotrite broke at the angle of the female blade and I had to operate to get it out. In another case the blade was so badly bent that I had to do a suprapubic cystotomy to get the stone out. In both of these instances I had promised the patients that they would be in the hospital only a few days. I find that the use of a small lead hammer and tapping on the handle of the lithotrite will cause the engaged stone often to fly to pieces, just as a nut will fly to pieces when cracked with a hammer. Similar accidents occur with the Young rongeur. I have also noted that with the instruments described here the fragments will be crushed and portions held tight on the blades so we cannot get them out of the bladder. Then I find that by tapping on the instrument a number of times we can loosen the stones that are engaged and permit the blades to come together again.

DR. ALBERT E. GOLDSTEIN, Baltimore: I think we should do operations for bladder stone under visualization in many instances. The old lithotrite is rather strong and can be used, but the operation should be done under visualization. Several years ago I devised a method of crushing these stones under the fluoroscope. The bladder is filled with air, the patient is placed under the fluoroscope, the lithotrite is placed in the bladder, and the stone is visualized and removed. This permits all the crushing that may be necessary. I am cautious never to bring the male and female blades together for fear they will be caught. If they should be caught in this way, they are always under the eye and we can determine whether we should remove one blade or the other, and we are also certain that we are not catching any part of the bladder. One can keep on groping about until one has all the large fragments broken, and can then introduce the evacuator.

DR. O. D. PHELPS, Worcester, Mass.: I recall two cases of calculous anuria. The first was that of a woman who had had a nephrectomy for a double calculus. She had progressed pretty well but came under attention because for three days she had not passed any urine. Everything failed to cause secretion of urine and she died. A second patient had pain in the side and she had not voided urine for two and a half days. A nephrostomy was done but she still failed to pass any urine and died.

DR. HUGH CABOT, Ann Arbor, Mich.: I did not expect to lay down all the possible contraindications to this procedure, and I quite agree with Dr. Hooe that there is a group of individuals with a great variety of difficulties that constitute a contraindication; but I think that if they were all grouped together they would constitute only a small number. In regard to Dr. Mackay's remarks, I have a notion that the proper thing to do is to find out whether the lithotrite is the proper instrument to use before attempting to use it. I went into an instrument house in New York some years ago and asked if they had any lithotrites and they said "Yes." I asked to see them and they brought them out. I asked if I could test them in the same way I did all of my own, which is to put a lead ball between the two blades, and was told that I could. I will only remark that when I retired there was not an instrument in that shop that was whole, and I decided that he was quite wrong and that they did not have any lithotrites. I think that such an instrument must be a real instrument before one starts. Undoubtedly there are instruments so constructed that they cannot stand great strain, and they should be selected and used only when calculi of hard consistency and large size are not to be dealt with. The day before I left I crushed a stone that was so hard that I took the skin off my hands in turning down the screw, but the instrument neither broke nor bent. I did not expect that it would. The very interesting instrument shown here seems to add something. I agree that the older lithotomists were skilled in the use of things that we do not need to be. We have the cystoscope and they had nothing but the sense of touch. We may modify our instruments so that we can work

under sight and shorten the operation, which in their hands was often a very prolonged one. Sessions of one and a half to two hours were by no means uncommon, because the whole situation was dealt with blindly, as we do not have to do. These instruments must be strong or they should not be employed. As to doing the operation under the fluoroscope, I confess I think it unduly complicated. I think the operation should be finished by the time we get everything in order, our hair parted properly, and so on. I think we should be ready to go home to lunch, having done the operation the other way.

FRACTURES OF THE CLAVICLE*

E. L. ELIASON, M.D.
PHILADELPHIA

The clavicle is one of the most frequently broken bones in the body. Statistics show that from 5 to 10 per cent of all fractures occur in the clavicle. Factors that contribute to this frequency are chiefly concerned with the anatomy of the parts as well as the position of the bone with reference to the trunk. This bone is the earliest to ossify in the body. Its primary center appears in the sixth fetal week and at birth the entire bone is ossified except the two extremities. The true epiphysis appears at the sternal end at from 15 to 18 years of age and unites usually at nearly 25 years of age. Despite this late union, epiphyseal separation is extremely rare, only one case having been reported (Heath). The early ossification of the bone, plus the unusually thick periosteum at a time when all other bones are flexible, makes this fracture occur most often in youth.[1] Authors variously state that from 30 to 50 per cent of clavicle fractures occur under 10 years of age. In a series of 500 cases at the University of Pennsylvania Hospital, the incidence was 41 per cent. As the clavicle is the only bony connection (the key) between the trunk and the upper extremity, it is particularly subject to trauma as all falls on the upper extremity are of necessity transmitted to this bone. And yet nature has done much to strengthen this weakness in every part of the bone with one exception; namely, the exposed outer part of the middle third. It is in this portion that fracture most frequently occurs because it is the junction of two curves; it is the thin portion of the bone and it is not reenforced here by ligaments or muscles. Bennett [2] states that the position of the ligaments rather than any bone weakness no doubt localizes the fracture here, since experimentally the clavicle does not break at this point from longitudinal compression.

In order to treat this fracture properly, the deformity and the factors that cause it must be well understood. These factors fall into two groups, muscle pull and gravity. What happens when the bone breaks? The inner fragment remains practically unchanged in its position; possibly it is drawn up slightly by the sternocleidomastoid muscle. This pull is but slight, as the costoclavicular ligament is never broken and so acts to combat the muscle action. The displacement occurs by virtue of the freedom of motion in the joint, resulting from the costoclavicular ligament acting as a fulcrum. The outer fragment is the real offender in the deformity. The shoulder droops downward, forward and inward. The outer fragment goes with it and at the same time the inner end of this fragment is directed backward. The downward displacement is due to the latissimus dorsi, the pectoralis major and minor muscles and gravity; the levator scapulae, the pectorals and the latissimus dorsi draw it inward and cause the overlap; the forward deformity is due to the serratus magnus and the pectorals. The compound slope due to the conical shape of the bony framework of the chest accentuates the downward and forward slump of the shoulder.

This position of the shoulder occurs in any fracture of the shaft of the clavicle in which there is separation of the fragments, whether at the extremities or in the shaft itself. At the outer extremity the resultant deformity is almost nil, because of the coracoclavicular, acromioclavicular and the coraco-acromial ligaments. Should the fracture, however, be proximal to the conoid ligament, the shoulder will show the characteristic deformity. Fractures near the sternal end give but little change in shoulder position in the average case, provided the costoclavicular ligament remains intact.

ETIOLOGY

In the new-born the fracture is due to the compression trauma incident to the passage through the birth canal with the associated force applied by the hand of the obstetrician. This is usually of the incomplete type and occurs at the common site. In my series there were ten cases of birth fractures. After birth 94 per cent of the injuries were due to indirect violence, described as a fall from a height in 175 cases, a fall on the shoulder in ninety-three, automobile accidents in fifty-five and athletics in twenty-four. Fractures due to direct violence were usually transverse and in the outer third of the bone, while the rare fracture due to muscular action occurred in the inner third of the bone. Polaillon,[2] after a careful analysis of reported cases, reaches the following conclusions:

> The muscles that break the bone are the deltoid and the clavicular portion of the great pectoral. In no case does the fracture appear to have been produced by the sternomastoid muscle. The commonest movements producing fracture appear to be violent movements of the limb forward and inward or upward. The resultant deformity is an anterior bowing.

A fracture has been described as due to a simultaneous depression and backward thrust of the shoulder, angling the bone over the first rib. In this series of 500 cases there was only one such case.

In adults the fracture is usually a simple complete one of the oblique type, although occasionally there is comminution even in the absence of direct violence. In children the fracture is usually incomplete. After puberty, however, the complete fractures are more common and the line is usually transverse. Football was responsible for many of these.

Fracture of this bone is rarely compound and, when so, the trauma is of the direct type, in the nature of gunshot or war wounds, or associated with severe crushes or lacerations that greatly outweigh the fracture in the importance of treatment.

DIAGNOSIS

The typical adult fracture does not offer a problem in diagnosis. There is usually the history of trauma, local pain and tenderness and the typical angular deformity, with overlapping, the shoulder being downward, forward and inward. The patient assumes a characteristic attitude with the head inclined toward the injured side, the chin being directed toward the opposite shoulder. This is not so often noted in children. The forearm flexed to a right angle at the elbow is supported and pushed upward by the other hand. Crepitus and

* Read before the Section on Orthopedic Surgery at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 13, 1928.

1. White, J. W.: Lectures to students.
2. Quoted by Treves.

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preternatural mobility are readily demonstrated by direct palpation or by raising or lowering the arm. In the absence of deformity, local tenderness and pain referred to the site of injury on voluntary raising of the arm are sufficient, usually, for the making of a diagnosis. Fracture near the extremities may give considerable deformity, confusing the picture with dislocation possibilities. This is especially true at the outer end, where an acromioclavicular dislocation with or without a fracture of the tip of the clavicle occurs very frequently. A roentgenogram should clear the picture.

In children, pain on being lifted by the arm or slight disinclination to use the part may be the only signs of possible fracture. Careful examination will reveal tenderness or a tumefaction at the suspected site. In examining these little patients one should first gain their confidence and then manipulate the uninjured member for a while, before directing attention to the injured limb, which should be examined gently, beginning with the hand, and progressing to the wrist, the elbow and the shoulder. Failure to carry out these procedures has more than once resulted in an erroneous diagnosis of a forearm or elbow injury because of the cries of the little patient, not from pain but from fright. In such a situation a splint has often been worn on the forearm or humerus for a week and only the mother calling attention to an increasing lump on the clavicle leads to a correct diagnosis.

Roentgen Examination.—Except in dislocations of the inner end of the clavicle the anteroposterior or postero-anterior view is the only one that can be made, and dependence on stereoscopic films as a routine measure is a safe practice for both diagnosis and treatment. In the very young the greatest care must be observed in making the exposure while the clavicle is as nearly parallel as possible with the film, as otherwise the shadow will appear almost end on, especially if a Velpeau or Sayre dressing is applied. Greenstick fractures in the young with little deformity require the very best detail possible. Fractures close to the inner end of the body present the greatest difficulty and the exposure should be made postero-anterior and so as to have the vertebral shadow clear those of the inner ends of the clavicles. A well directed lateral view (sitting posture) will serve to distinguish a fracture of the inner end from a dislocation. Quesada [3] advocates taking two views at right angles to each other with the patient face down on the films. He has found this the most satisfactory means of obtaining the most information with regard to position and comminution.

Complications.—Injuries as the result of the fragments are very infrequent. Cases are reported of nerve, vessel and lung injury, but these are extremely rarely due to the bone fragments. This is probably because the periosteum is extremely tough and thick, being further strengthened on the inferior aspect by the subclavius muscle. These all, however, have occurred as a result of the same trauma. Nevertheless, associated bony injuries are not unusual. In this series there were thirteen associated fractures of the scapula; six dislocations of the outer end of the clavicle; six fractures of the humerus; nine fractures of one or more ribs; three dislocations at the shoulder, and three fractures of the olecranon.

TREATMENT

During the last ten years somewhat more than 100 articles have been published on fractures of the clavicle, many of which were descriptive of a new type of fixation dressing. Bela von Mezö,[4] in 1921, collected eighty-five published methods of fixation for this fracture. This multiplicity can mean but one thing; namely, that as yet there is not a satisfactory method for handling all fractured clavicles. Since 1921 several more new methods have been described, showing that the surgeon is still on the hunt for a satisfactory ambulatory treatment that will be comfortable, restore function and minimize deformity. There need not be any fear of incomplete union, as this is so rare in closed cases that it may be ignored. Union occurs despite the fact that fixation is not complete, motion occurring from eighteen to twenty times a minute with respiration. Union will occur and, despite deformity, a good function will result. This is shown by the results in innumerable cases in which the fracture was never treated because of oversight or the seriousness of other injuries. Furthermore, patients with complete removal of the clavicle have excellent function.

Incomplete or greenstick fractures can well be handled with a Velpeau or Sayre dressing or any one of their many modifications. These patients require protection for from two to three weeks and a sling only for another week, when recovery is complete. In those cases of complete fracture difficult to retain in position, the type of treatment will depend on the patients' desires. If they wish the least possible degree of deformity and the ambulatory dressing does not maintain proper reduction, then they must submit to the bed or recumbent treatment. If they are willing to suffer some discomfort and will be satisfied with the deformity of a lump and a narrow shoulder, then a choice of one of the other eighty-seven known dressings can be used.

These dressings all act to force the shoulder upward, outward and backward and to hold it there. The forces that have to be combated are muscle pull and gravity. I feel that muscle pull is negligible but that gravity is the important thing. The contour of the ribs is such that, if the shoulder is pushed back, it will of necessity be pushed up. In other words, if the shoulder can be held back it will stay up and the outer fragment will fall into place. This backward position is poorly maintained by any and all of the dressings, bandages or adhesive tapes that bind the arm to the trunk, as the clavicle acting as an outrigger to hold the shoulder away from the chest is broken. The natural position of relaxation or slump is with the shoulder downward and forward. Hence muscle relaxation will not accomplish the backward position. If the shoulder is pushed back, the scapula will lie flat on the posterior aspect of the ribs and, conversely, if the scapula is flattened on the ribs, the shoulder will be carried up and back. Two types of treatment will accomplish this, the posterior splints and the recumbent treatment. The posterior splints, such as the Landry, DuPuy, Hawley and Royster, posterior or anterior, permit the patient to be ambulatory and to use the limb, but it is exceedingly difficult to make these patients comfortable. Furthermore, although they may be applied with the fracture reduced, the bandages and straps soon become loosened; the slump in the shoulder occurs, and pressure against the axillary folds or the coracoid process causes irritation and even pressure ulceration. Richards [5] used the Landry splint in fifty patients and only one complained.

Most of the numerous dressings reported have been devised with the hope of getting comfort and few, if

3. Quesada, T.: Surg. Gynec. Obst. **42**: 424-428 (March) 1926.

4. Von Mezö, Bela: Zentralbl. f. Chir. **48**: 886 (June 26) 1921; **48**: 968 (July 9) 1921.

5. Richards, T. K.: Fractured Clavicles, J. A. M. A. **79**: 1839-1840 (Nov. 25) 1922.

any, have succeeded; those only have been successful that tend to hold the scapula back rather than up by support under the elbow, axilla or forearm. It seems to me that as deformity cannot generally be prevented by ambulatory methods and as good union and function are practically universal, comfort is the keynote. In a few selected cases, I have used with success an adhesive dressing laced with elastic bands, augmented by a forearm sling. This dressing is especially useful if the fracture is complicated by a subluxation at the acromioclavicular joint.

Some writers advocate plaster-of-paris casts or molds, with traction efforts exerted on the shoulder. This seems unusually cumbersome and burdensome and uncomfortable, except possibly for selected cases.

The recumbent treatment, although somewhat tiresome, gives the best anatomic results. It is applicable in birth fractures as well as at all other ages. It is virtually compulsory in bilateral fractures, badly comminuted fractures, many fractures complicated by wounds, multiple fractures, and in those patients demanding minimum deformity.

Furthermore, in young athletic persons with a transverse fracture that cannot be reduced or maintained in reduction, this dressing is preferred, because several patients with overlap union have again had fractures through the same site the next year when strenuous sport has caused a similar trauma.

The bed treatment was popularized by Coutland.[6] He first places the patient on his back on a firm flat mattress with the arm hanging over the side of the bed; a pillow is placed under the head but not under the injured shoulder. This position is held for an hour to an hour and a half, when the fracture will have become reduced. Then the second position is assumed by simply placing the forearm on a pillow on a bedside support, slightly lower than the elbow, but not supporting the elbow itself, rather leaving it so that gravity still acts. A sling for the wrist to the side of the bed may be used. This is maintained for seven days.

An assistant who experimented with the first position found it unbearable after the first forty-five minutes. The second position was comfortable.

Milliken[7] uses his own modification of the supine position, raising the head of the bed and fastening the upper limb of the affected side to the head of the bed, thus causing abduction and external rotation of the humerus. Weight traction is added. Conwell[8] also uses traction and recumbent treatment.

The simple recumbent position with a shot bag on the shoulder for weight and restraint reminder has been entirely satisfactory in my hands. A flat bed, made so by a board beneath the mattress if necessary, a small head pillow, a loose wrist sling possibly, and a warning against raising the head by its own efforts, turning up the side unaided, or other motion in the shoulder suffices for a favorable beginning.

After two, possibly three, weeks an ambulatory dressing of the laced type, or other supports as chosen, will be sufficient support for another one to two weeks. It is not well to permit shoulder sag too soon, as it will result in angulation, excessive callus and deformity. The length of time in bed is governed by the rapidity of callus formation. From two to three weeks usually suffices.

I recently saw an unusual treatment for a badly shattered compound fracture; namely, surgical removal of the entire clavicle. The patient treated in this way has excellent function.

6. Coutland: Tr. Acad. Med., May, 1914.
7. Milliken: Personal communication to the author.
8. Conwell: Personal communication to the author.

SUMMARY

Ambulatory dressings for fracture of the clavicle are generally unsatisfactory as regards comfort and anatomic perfection, although function is almost universally all that could be desired. The multiplicity of methods points to the unsatisfactory state of such fixation. The recumbent methods which take cognizance of the necessity of a scapula flat on the chest will give the best results anatomically as well as functionally. Complications other than associated bony lesions are very rarely due to the fractured bone itself. Open reduction is seldom necessary. It is the man behind the splint that counts.

326 South Nineteenth Street.

ABSTRACT OF DISCUSSION

DR. PAUL B. MAGNUSON, Chicago: No splint having for its object lifting weight is comfortable, and nothing that can make pressure on any part of the body is comfortable for any considerable period of time. One thing that the men who are interested in fractures can do for the benefit of humanity is to eliminate descriptions of the Sayre dressing from all textbooks. It is a good mechanical scheme, but from the standpoint of the patient it is an extremely unworkable proposition. In the first place, it uses for a fulcrum a tight band around the arm which is held backward by adhesive plaster and run around the body. Second, it raises the arm and the clavicle by a lift with adhesive plaster running down the back of the arm over the elbow and pulling the arm upward and forward to force the shoulder on the other side of the fulcrum backward and upward. From an engineering standpoint that will work. From the standpoint of the individual it does not work because it constricts the circulation and puts pressure on the soft tissues at uncomfortable points, and the patient cannot stand the dressing for the length of time sufficient to reduce the fracture. The T splint is really as comfortable a form of dressing for fractured clavicle as any other. If we are going to expect perfect anatomic results in these patients we have to stop considering them ambulatory. Because the patient can walk is no reason that he should walk if perfect anatomic results are to be expected. However, in these cases satisfactory functional results can be obtained in the large majority by the usual method of treatment, that is, holding the arm by some apparatus backward and upward, and the T splint seems to be the most satisfactory apparatus for such treatment. As to the mechanics, we are all familiar with the results of falls on the shoulder. Reduction is comparatively simple if the patient is lying on his back with a narrow sand bag between the shoulders and direct backward and upward pressure is made on the shoulders, even after some days have elapsed since the fracture. The treatment is the important thing, and the treatment is uncomfortable at best unless the patient is recumbent. If he is recumbent, it is not uncomfortable.

DR. ROLAND HAMMOND, Providence, R. I.: I have seen roentgenograms which illustrated the difficulty of making a diagnosis of a fractured clavicle in an adult. In some of them a fracture of the clavicle could not be seen. Yet the patient continued to suffer pain and at the end of four weeks, a second picture was taken showing a complete fracture. A plate made a few days after the second one showed upward displacement.

The Fetal Heart.—Galen (about 300 A. D.) gave the first adequate description of the fetal heart. He described the foramen ovale and the ductus arteriosus and mentioned their fates after birth. He further commented on the remarkable provisions of nature in requiring but a small amount of blood to flow through the lungs before their respiratory function began. While Galen's account of the anatomy of the fetal heart was quite accurate, he reversed the course of the blood and described it as flowing from the aorta to the lungs by means of the ductus arteriosus.—Kellogg, H. B.: The Course of the Blood Flow Through the Fetal Mammalian Heart, *Am. J. Anat.*, Nov. 15, 1928.

POSTOPERATIVE CATARACT INFECTIONS *

WALTER SCOTT FRANKLIN, M.D.
SANTA BARBARA, CALIF.
AND
FREDERICK C. CORDES, M.D.
SAN FRANCISCO

The operation for the extraction of a cataract has been brought to a high degree of safety. It is most unfortunate for the patient and humiliating to the surgeon to have the result lessened or destroyed through the occurrence of an infection. As an operation both well planned and well executed can, however, be so endangered, attention should be focused mainly on prophylaxis.

Postoperative infections come either from without or from within; those that are ectogenous should be practically under control. The proper sterilization of instruments should not need comment. However, as the ophthalmic surgeon is often forced to operate at a general hospital, he should supervise the proper handling of his delicate instruments, while caring for their sharp cutting edges.

A certain carelessness on the part of many surgeons in regard to their hands and those of the assistant is very noticeable. It has been our custom, during the past twelve years, to wear rubber gloves as a routine measure in all ophthalmic operations. As a number of visiting surgeons have commented on the delicacy of touch shown during operations of the intra-ocular type, a brief consideration of the value of gloves may not be amiss.

Sense of touch is relative. If one wore gloves part of the time, as in the extra-ocular conditions, and operated without gloves at other times, a confusion might result. But using gloves for all the surgical procedures gives a uniformity to one's sense of touch and a feeling of familiarity in their use. A proper technic also has a salutary effect on students and on general surgeons which must not be neglected by those of us in teaching positions. The criticism of narrowness and carelessness is at times justified when directed toward so-called specialists. Finally, a further advantage of gloves is that the time of scrubbing is shortened, and one's feeling of security is markedly enhanced.

Another essential in prophylaxis is a mouth and nose mask. On a recent trip East it was deplorable to see the carelessness in this regard. Practically all the surgeons wore a cap, but few had masks in place. As surgeons usually lean over a patient and talk during the operation it would seem evident that a mask is the more essential, though both should be worn.

In the etiology of the ectogenous type of infection, we are dealing primarily with the surrounding tissue. The various forms of conjunctivitis are a strong contraindication to operation, as is also any infection of the lacrimal apparatus. The organisms found in the normal conjunctiva do not produce any inflammation, because of their saprophytic nature; when, however, these are introduced into the globe they excite inflammation. It is therefore most important that their number be reduced to a minimum before operations. The introduction of infection at the time of operation from external routes must also be considered. In the cocainization of the eye by a stock dropper bottle, there is another possible source. This also applies to any solution used within the first few days. Several years ago a series of infections in one of the hospitals was traced to a bottle of atropine which had been used in a case of panophthalmitis. The dropper had undoubtedly been contaminated, as cultures of the solution gave the same organism as that found in all the cases. Trauma to the conjunctiva or cornea during the preparation of the eye is to be avoided. Axenfeld [1] urges the use of a speculum rather than the holding of the lids by an assistant, as the removal of a possible source of infection. This objection is easily overcome by the wearing of sterile rubber gloves, as previously mentioned. We feel that the holding of the lids by a trained assistant has many advantages over the use of a speculum.

In the endogenous type of suppuration, the various foci of infection play the most important rôle. These will be considered in detail under prevention.

Inflammation resulting from lens matter in the eyes of persons hypersensitive to lens protein, which Verhoeff and Lemoine [2] have called phaco-anaphylactic endophthalmitis, should be kept in mind, as it is frequently mistaken for infection.

We feel that the prophylaxis of these suppurative infections is most important and should receive the greatest emphasis in a paper of this type.

The cases of frank conjunctivitis naturally require treatment, and a cure before operation can be contemplated, and need not be considered here.

Following an operation, most infections probably gain entrance from the conjunctiva, since this cannot be thoroughly sterilized. Byers and Bruiere,[3] after a vast amount of effort, were unable to sterilize the conjunctiva. From this we infer that the normal conjunctiva is practically never free from organisms. The conjunctiva varies a good deal at different times in the same eye, the upper part of the conjunctival sac containing fewer organisms than the lower. As a rule these organisms are most numerous at the inner canthus, especially in the neighborhood of the caruncle.

The organisms most frequently found in the normal conjunctiva by Collins and Mayou [4] are *Bacillus xerosis*, 94 per cent; *Staphylococcus albus*, 79 per cent; pneumococcus, 9 per cent; streptococcus, 5 per cent; diplobacillus, 6 per cent; *Staphylococcus aureus*, 6 per cent. It can be remarked that the xerosis bacillus and *Staphylococcus albus* are almost constantly present. These organisms, even the pneumococcus, have a saprophytic phase developing pathogenicity when conditions, such as an obstructed tear sac, are especially favorable to their development. When introduced into the interior of the globe they cause inflammation; in fact, the staphylococcus is by far the most common cause of the suppurative as well as the nonsuppurative infections following operation.

As pointed out, the organisms usually found in the normal conjunctiva are the causative organisms in most cases of ectogenous infections. It is therefore of utmost importance to reduce their number as far as possible before operating.

* Read before the Section on Ophthalmology at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 15, 1928.

1. Axenfeld, T.: Wound Infections and Complications in Cataract Extraction, Klin. Monatsbl. f. Augenh. **75**: 407, 1925.
2. Verhoeff, F. H., and Lemoine, A. N.: Endophthalmitis Phaco-Anaphylactica, Am. J. Ophth. **5**: 737-745, 1922.
3. Byers, W., and Bruiere, A.: Routine Bacteriological Examination of the Conjunctival Sac, Tr. Am. Acad. Ophth. & Otolaryng., 1924, pp. 141-148.
4. Collins and Mayou: Pathology and Bacteriology of the Eye, ed. 2, Philadelphia, P. Blakiston's Son & Co., p. 486.

Byers and Bruiere [3] maintain that routine bacteriologic examination before operation is essential. This opinion is also the belief of many others.

Bell [5] operates if the eye looks clinically clean, regardless of the organisms found in the conjunctival smear. Gifford, in his discussion of Byers and Bruiere's paper, declared that when the conjunctiva and lacrimal apparatus were clinically normal bacteriologic examination was not essential. We feel that when the conjunctiva appears to be normal and the lacrimal sac does not show any evidence of inflammation it is not necessary to do a bacteriologic examination before an operation. When there is a suggestion of secretion from the conjunctiva, it should be done.

In making a bacteriologic examination a conjunctival smear is unsatisfactory, as a relatively large percentage of negative smears are positive to culture. In obtaining a culture the pipet method, which consists in instilling a small amount of physiologic sodium chloride solution and drawing it off with a pipet, gives the best results.

Where the cultures are positive, especially to *Staphylococcus aureus* or the pneumococcus, the conjunctiva should receive treatment. For this we feel that the use of 1 per cent silver nitrate applied to the everted lids gives satisfactory results. In addition, the use of mercuric oxycyanide, 1:7,000, in the form of drops to be used at home every four hours, forms a valuable aid.

The use of mercurochrome-220 soluble also has its adherents. The Friedenwalds [6] found that a 2 per cent solution of mercurochrome in disinfecting the ocular field produced almost complete sterility for several hours after operation. Twenty-four hours later there was still an inhibition of bacterial growth. Stanka,[7] in his investigation of bacteriologic prophylaxis, found that streptococci disappeared most rapidly after the use of 2 per cent ointment of yellow mercuric oxide and the rinsing of the conjunctival sac with a 1:5,000 solution of mercuric oxycyanide. Rinsing with mercuric oxycyanide solution plus ethylhydrocupreine hydrochloride gave a similar but less rapid result. Small staphylococci disappear most rapidly with the use of ointment of yellow mercuric oxide alone. Elschnig favors the use of the mercuric oxycyanide, which he employs as a collyrium.

The frequency of the staphylococcus and the pneumococcus as a cause of sepsis has led to the use of vaccines and serums for the production of an artificial immunity as a protective agency against infection before cataract operations. We have not had any experience with this. In several cases of persisting staphylococcus conjunctivitis we have had good results with the vaccine; in others, however, it has been very disappointing. Jaensch and Kollath [8] found a protein bacillus present in a preoperative cataract that proved most virulent in a rabbit. By the use of an autovaccine the infection was cleared and the operation performed without the presence of postoperative infection.

Another precaution that we will merely mention is the use of the conjunctival flap. The flap accelerates the closing of the wound and in this way reduces the chance of infection from the conjunctival sac.

Conjunctival sutures are considered by others in this symposium.

Lacrimal sac infection must be dealt with before an operation can be considered. In the milder types, without complete closure of the lacrimal canal, conservative treatment should be tried. Lavage, through the lower canaliculus, with mercuric cyanide, 1:10,000, will clear up a certain percentage of cases. In several instances the use of 2 per cent ethylcupreine hydrochloride has given excellent results. When the suppuration of the lacrimal canal is slight, some recommend the searing of the puncta or ligation of the canal with a single thread. This procedure does not seem safe. When actual obstruction is present, surgery should be resorted to. The modern operations of the Totti-Mosher type give much better functional results than does extirpation. It does not seem wise, however, to open up the conjunctival sac to direct communication with the nasal passages. Extirpation of the tear sac is the best procedure in these cases, and to be entirely safe the canaliculi should be opened and the mucous membrane destroyed.

Before operation the patient should be in usual health. A physical examination is desirable, particularly a urinalysis to determine the presence or absence of diabetes or nephritis, so that a proper diet can be prescribed during convalescence. Other factors with which we are not concerned in this paper also demand a knowledge of the patient's physical condition.

Foci of infection play a most important rôle in the endogenous infections. Fergus [9] reports a severe endogenous infection from teeth and emphasizes the necessity of removal of foci of infection before operating. Bobone [10] lays great stress on the possible infections from foci in the genito-urinary tract, especially from latent prostatitis. Killen [11] reports an endogenous inflammation due to a staphylococcus infection of the bladder. He obtained improvement with the use of an autogenous vaccine. Bell [5] emphasizes the importance of the elimination of dental and tonsillar infections as well as gastro-intestinal toxemia.

Although desirable, it is not always practical to submit all patients to a careful and complete examination for possible foci of infection. A careful history and inspection of the mouth will usually give some suggestion if foci are present. In cases in which a possibility of these is suggested, their destruction must be insisted on. Teeth are a most important factor, and when infection is suspected they should be examined roentgenographically and the proper dental hygiene used. A purulent sinusitis is also a contraindication to operation.

In the prevention of infection, the preparation of the patient at the time of operation is important. Gifford uses zinc chloride, 0.2 per cent, and 10 per cent mild silver protein three times a day for twenty-four hours preceding operation. Bell [5] uses 1 per cent silver nitrate one hour before operating, and follows it immediately with 25 per cent mild silver protein. Lindner [12] also found this very satisfactory. We have depended on careful lavage of the conjunctival sac at the time of preparation.

Bandaging the eye before an operation is to be avoided, as it tends to promote an abnormal secretion through retention and the consequent proliferation of the bacteria normally present.

5. Bell, G. H.: Danger of Infection Following Operations Where Eyeball is Opened, M. J. & Rec. **123**: 635 (May 19) 1926.
6. Friedenwald, J. S., and Friedenwald, H.: Preparation of an Aseptic Field for Operations on the Eye, Tr. Ophth. Soc. U. Kingdom **45**: 779-786, 1924.
7. Stanka, R.: Bacteriologic Prophylaxis of Eyeball Operations, Klin. Monatsbl. f. Augenh. **72**: 432, 1924.
8. Jaensch and Kollath: Prophylactic Vaccine Therapy Before Operation, Klin. Monatsbl. f. Augenh. **77**: 212, 1926.
9. Fergus: Cataract Extraction Followed by Symptoms Suggestive of Sympathetic Ophthalmia, Brit. M. J. **1**: 182 (Feb. 3) 1923.
10. Bobone, T.: Preoperative Measures in Treatment of Cataracts, Abst. Internat. Sun. Ophth. **5**: 137, (1923.
11. Killen, W.: Endogenous Infection After Needling for Cataract, Tr. Ophth. Soc. U. Kingdom **42**: 376, 1922.
12. Lindner, K.: Infections After Operations on the Eyeball, Ztschr. f. Augenh. **53**: 305, 1924.

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At the time of operation the area about the eyes should be washed thoroughly with sterile green soap and warm sterile water, special attention being given to the lids and cilia. The cilia, when free from blepharitis, are comparatively sterile and lie outside the conjunctival sac. It is possible to produce an infection through contamination of instruments by their coming in contact with the cilia. The conjunctival sac is then thoroughly lavaged with a solution of mercuric chloride, 1:5,000, or some other antiseptic solution. This mechanical lavage is the most important factor, as it is impossible to sterilize the conjunctiva completely.

Following this preparation and the draping of the patient with sterile sheets, a double thickness of gauze, moistened in mercuric chloride solution and having a circular opening, is placed over the face.

Patients vary considerably in their subjective reactions to discomfort and pain. It is therefore better practice to remove the bandage within twenty-four hours and examine the wound.

Suppuration usually occurs during the first two to three days, although occasionally it is delayed for a week. The picture of beginning infection varies. In the ectogenous type the lids show some edema the day following operation; there is present some mucopurulent discharge in the inferior culdesac, and the wound has a more or less grayish appearance. The next day a good deal of mucopurulent discharge will be present and the wound will have assumed a yellowish appearance with perhaps some signs of inflammation in the anterior chamber, in the form of grayish threads. This may go on to panophthalmitis or the cornea may break down with the formation of a ring abscess.

In the endogenous type the disease begins with the symptoms of suppurative iritis; that is, discoloration of the iris, cloudiness of the aqueous, hypopyon, and a yellow exudate in the pupil and coloboma. In the very early stages the cornea, wound and conjunctiva may be entirely normal but later are also involved.

The presence of acute suppurative infection does not always mean the loss of an eye; a certain percentage respond to energetic treatment so that the patient may still have vision. Even though the process may subside, some evidence of the disease usually persists in the form of a membrane in the pupillary area. As long as light perception remains, the case should not be considered hopeless.

If suppuration is present, the most energetic treatment is indicated. If the process is limited to the wound, the actual cautery should be used quite fearlessly. It may be necessary to enter the chamber with it. Ice compresses, carried out with precision, lavage with mercuric oxycyanide and frequent instillations of mercurochrome are of signal value, as are also atropine and ethylmorphine hydrochloride. Internally the salicylates should be pushed according to the method emphasized by Gifford.

The foreign protein reactions have of recent years taken an important position in the treatment of suppurative inflammation of the eye.

Key,[13] following his experimental work, recommends diphtheria antitoxin. He has not observed any serious anaphylactic effects, and doses have varied from 1,000 to 5,000 units, with a total in one case of 12,000 units.

Milk injection has its advocates, particularly in the Viennese clinics, but as Barkan and Nelson [14] point out, the "milk reaction" is not a milk reaction at all. It depends on milk bacteria and the soluble products of their metabolism and not on native milk proteins. Our results with milk injections were not uniform or satisfactory.

Typhoid vaccine has given the best results in our hands. An initial dose of from 50 to 100 million is given intravenously at the first sign of inflammation. Two days later a second dose of twice the amount of the first is given. If, however, there has been a severe reaction following the initial injection, the second is not doubled. Two days later a third dose of 300 million is given. The amount of the initial dose depends somewhat on the size and weight of the patient.

Finally, we wish to emphasize the fact that the best treatment of suppurations is the prevention of infection.

22 West Micheltorena Street—384 Post Street.

13. Key, B. W.: Antidiphtheric Serum in Ocular Infection, Tr. Sect. Ophth., A. M. A., 1923, pp. 138-166.
14. Barkan, Otto; and Nelson, R. F.: The Active Agent in Milk Injections, Tr. Sect. Ophth., A. M. A., 1923, pp. 131-137.

IRITIS, IRIDOCYCLITIS AND PROLAPSE OF THE IRIS IN MODERN CATARACT SURGERY

PREVENTION AND TREATMENT *

LLOYD MILLS, M.D.
LOS ANGELES

The tardy and still lagging adoption into ophthalmic surgery of certain sound and vital principles of general surgery can be explained only by assuming that the inertia of traditional routine has been too impelling easily to be diverted. It is likely that even this influence would have been overcome at an earlier period had there been sufficient generalized training in those surgical fundamentals which vitalize inborn surgical instinct.

This lack of surgicalmindedness still is evident in the timid resort to surgery in the treatment of glaucoma, in the mincingly delicate incisions employed repeatedly for cataracts occurring in the young, and in the inadequate operations for strabismus. Probably nowhere in ophthalmic surgery, however, has more disaster followed the neglected application of these first surgical principles than in cataract surgery. The universal adoption of these principles is likely to witness the near elimination of the persistent incidence of exogenous infections and of secondary prolapse of the iris following the removal of cataract by the occasional operator and their full mastery by the real ophthalmic surgeon.

These complications steadily have been reduced from their former high incidence by the successive steps of aseptic preparation; the introduction of the combined operation; the replacing of corneal by peripheral incisions; peripheral iridectomy; capsulectomy; corneal suture; irrigation of the anterior chamber; preoperative reduction of the hazards of systemic and focal infections; conjunctival flaps; intracapsular extraction where indicated; the use of retractors; effective local anesthesia, especially in the form of nerve blocking, and suture of part or all of the conjunctival flap. Appropriate combinations of these measures and their studied application to suitable cases by certain of the more experienced operators already have resulted in as nearly a complete elimination of these postoperative embar-

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rassments and disasters as ever may be possible when the variations in operative skill and in behavior on the part both of patient and of surgeon are considered. No human judgment or skill can be perfect continuously, and there always will be operations in which no amount of forethought or technical ability can prevent failure.

This paper primarily is concerned with the prevention of intra-ocular inflammations, infections and prolapse of the iris following cataract extraction and, to a lesser extent with their treatment.

Inflammations and infections of the iris and uvea which occur after cataract extraction may be grouped, without any attempt to be encyclopedic, as exogenous or endogenous according to source and as iritis, iridocyclitis or panophthalmitis according to their type, severity and extent. Iritis and iridocyclitis by common usage are held to be identical forms of reaction, differing only in degree, and, for brevity, are considered as iritis hereinafter.

I. POSTOPERATIVE IRITIS

Postoperative iritis, for the purposes of this discussion, is considered under the following heads: (1) traumatic iritis; (2) endophthalmia phacoanaphylactica; (3) endogenous infection or inflammation; (4) exogenous infection.

1. *Traumatic Iritis.*—This is the usual form of inflammation, most often transitory, symptomless and without infection, which follows cataract extraction, and is a normal reparative reaction to tissue insult of any kind.

(*a*) Traumatic iritis is more apparent after rough handling of the iris and after the stretching and tearing of the sphincter iridis which occurs in the passage of too large, too hard or too sharply edged lenses through the intact pupil; naturally it is noted more often after intracapsular delivery. This divulsion of the sphincter is more likely to be the cause of the nausea which not seldom accompanies this form of extraction, rather than the anesthetic used, for the same type of nausea follows sphincteric divulsion elsewhere. No defect of vision or of iridic function has followed this form of reactive inflammation, in my experience, and while the local reaction may be slightly prolonged, invariably it subsides under atropine and rest, leaving, at the most, areas of iridic atrophy and fractional deformity of the pupillary margin to mark the site of the torn sphincter.

(*b*) Hard fragments of lens, often with harsh edges, may produce a decided mechanical iritis in the rôle of a foreign body. The threatening presentation of vitreous is a sound excuse for failing to remove such fragments. The necessity for extracting lenses in fragments seldom occurs, however, save when an incision has been made relatively too small. A far safer procedure under such circumstances is to enlarge the wound laterally with scissors; or, if conditions seem to make this irregular form of extraction imperative, it is better to place a bridle suture in the superior rectus and, thus given control over the vitreous, gently to tease these fragments out with Kalt forceps or by irrigation, the smooth, flat end of the irrigator tip itself often being most effective as a modified spoon.

(*c*) Bands of capsule, blood clot and lens débris may produce inflammation of the iris after combined extraction, especially when capsulotomy has been done, owing to their inclusion in the wound and subsequent traction on the iris. Filtering scars and persistent low tension may result, with all its grisly train of dangers, while the relation of these inclusions to secondary glaucoma by obliteration or obstruction of the filtering angle generally is understood. The prevention of primary inclusions is largely a matter of technic. When capsule forceps are used with a normal broad bite, it is seldom that capsular tags remain of a length sufficient to permit their inclusion. Irrigation of the anterior chamber, careful replacement of the pillars of the iris and cleansing of the lips of the wound of all tags of tissue in any case is fully preventive, provided the firm closure of the wound immediately is accomplished and maintained by ample suturing of the conjunctival flaps. There cannot be any guarantee against reinclusion unless this safeguard is used.

(*d*) The pressure and drag on iris tissue that is incarcerated in the wound may cause intense iritis. The causes, prevention and treatment of this condition are discussed farther on.

(*e*) A rare form of postoperative iritis occurs at times in connection with the pressure and drag on the intact iris of a hernia of the vitreous into the anterior chamber. The apex of such a hernia is outlined by fine exudate, occasionally associated with a tinge of blood. A slight fugitive secondary glaucoma may recur until the hyaloid is needled.

2. *Endophthalmia Phaco-Anaphylactica.*—The reaction of the uvea to retained lens protein, as shown by Verhoeff and others, may be so intense as to lead to loss of the eye. A small proportion of patients give positive skin reactions with lens protein, but, as the proponents of the methods of testing and desensitizing patients prior to cataract extraction have not yet fixed on reliable preparations and report falsely positive reactions in tests for skin hypersensitivity, it seems reasonable to defer the generalized application of this promising line of work until it is perfected.

Clinical and laboratory experience prove that lens cortex may be removed from the eye by careful expression and irrigation so fully as to make a serious reaction from this source almost negligible. The main means of preventing diffusion of cortical matter throughout the anterior chamber consists of continuity of pressure on the cornea until delivery of the lens elements is as complete as possible. Expression measures which leave a clear pupil after delivery of an immature lens often result on the following day in an anterior chamber which is well filled with white, swollen cortex, associated with more or less of an iritis. A very real benefit is obtained in this class of case, as well as in those cases in which retained lens matter clearly is evident, by the prompt effect which warm half-normal saline solution (Reese) has in giving definition to lens substance which otherwise is not visible. It is likely that there is an immediate change in the lens fibers in contact with salt solution, of the sort which causes the immediate opalescence observed in making lens extracts. The reformation of the anterior chamber by the solution also greatly improves the optical effect and visibility of objects behind the cornea. Concealed masses of cortex, clot and capsular fringe come to light, and if the last have the position or size sufficient to make them possible troublemakers, by reason of inclusion, iridic adhesion or secondary cataract, their removal by forceps and iris scissors is simple, in the presence of effective anesthesia. Without such anesthesia this simple removal may precipitate disaster in the sequence of intolerable pain, squeezing and loss of vitreous.

There is no detail in cataract extraction, the misuse of which may not be harmful. Thus Panas, an ardent early user of irrigation, later forbore to use it because of subsequent inflammations. We now know that his 1 per cent salt solution and saturated solutions of boric acid and of sodium borate were hypertonic and highly irritative. Too long and too forcible irrigation and too cold or too hot solution conceivably may cause iritis but they have no place in a well established technic. Irrigation, in my experience, has never been followed by iritis, a statement which will meet with general confirmation by those practiced in its use. It removes cortex more quickly, easily and completely than is possible by any other method of extracapsular operation and permits the extraction of immature cataracts which otherwise would be difficult to manage. Many forms of irrigation are in successful use, but the simple form of a soft rubber bulb and a flattened, slender and slightly curved glass tip is perhaps most effective. Every needful nuance of pressure and, at times, of suction, is wholly under control, while the tip may be used to dislodge recalcitrant fragments with safety. A bead of vitreous rarely may present after prolonged irrigation. Loss of vitreous during irrigation is practically prevented by firmly tying the sutures, which I always place at each angle of the wound, before introducing the tip. This measure at once reduces a bulging vitreous. The use of a grooved spatula at the angle opposite the irrigating tip also encourages the free flow of the stream through the chamber and serves to prevent too sudden filling of the anterior chamber which, if not guarded against, may give an unexpected sensation of pressure to the patient and provoke a slight reaction of discomfort. I have seen only two severe reactions from retained lens protein in 560 expression operations, one patient recovering with normal vision after four months of great discomfort, and the other having a gummy, thickly viscid lens which resisted expression, irrigation and spooning, resulting finally in an atrophied globe.

3. *Endogenous Iritis.*—This occasional and very troublesome form of iritis may occur from one to several weeks after any form of extraction or expression operation for cataract. Intra-ocular infection rarely, if ever, is implanted during the course of a cataract operation performed under modern conditions. It is conceivable that an old, quiescent iritis may be lighted up at times, but as nearly every form of bacterial and some spirochetal and protozoan invasions have been identified at some time or other as producing intra-ocular disease, particularly in the uvea, it is only logical to assume that the origin of these late inflammations is unrecognized focal or systemic disease. The iritis, in such infections, usually assumes the painful, plastic type, though occasionally it may appear in the "quiet" form. One of the four cases of endogenous iritis which have occurred among 722 extractions of all kinds in my practice resulted in enucleation for an intractable iritis of syphilitic origin. Unrecognized dental abscesses in a second case led to an extremely severe plastic iritis which reduced vision to mere perception of light and became quiescent only after the extraction of many teeth. A similar but milder uveitis became evident in a third patient nine days after the normal performance of a Barraquer extraction, four years ago. Symptomatic relief and a final vision of 6/6 followed the extraction of two abscessed teeth.

The last case of this group occurred two years ago in a sallow, thin man of the "intestinal type." Correct extractions, with peripheral iridectomy, conjunctival flap and full suture, had been done in each eye with an interval of one year between operations. The final corrected vision was 6/5 in each eye. Two months after the last operation the patient returned with a low grade plastic uveitis in the eye first operated on, associated with marked opacities in the vitreous and with vision reduced to 6/60. The usual routine examinations made before operation were repeated without result. In addition the Pirquet and Detré tests were negative; a provocative Wassermann test did not give any results; prostatic smears were normal, and a careful roentgenographic study of the chest and of the peribronchial lymph nodes did not show any abnormality. The only discoverable physical fault in this man was the presence of *Endameba histolytica* in large numbers in the stools. A course of vigorous antiamebic treatment was followed by a complete recovery from the eye condition save for the persistence of a ring of faint exudate on the hyaloid membrane corresponding to the margin of the pupil but without attachments to the iris. Vision has remained 6/5 to date. The second eye underwent identical changes about two months after the first became normal, the stools showing a fresh "shower" of amebas. This patient has not been made ameba-free owing to irregularity of treatment, but exudative changes in the iris have ceased, although the heavy opacities in the vitreous persist and vision remains about 6/30. This case was of particular interest in that it took the same form as the almost symptomless, low grade inflammation noted in protozoan iritis unassociated with operation. The contrast with the acute fulminating, painful inflammations occurring in bacterial invasion was as usual indicative of a difference in origins. The "disturbances of metabolism" to which Elschnig ascribed the frequent "iritis post extractionem" were apparently of this endogenous variety of iritis.

There seems to be some uncertainty as to how far our preoperative search should go in the attempt to eliminate possible sources of systemic and focal infection. Edward Jackson summarizes the current opinion as follows: "It would seem the part of prudence and good surgical judgment, so far as is practicable and without inflicting ill advised hardship, to eliminate all sources of focal infection before subjecting a patient to a serious ophthalmic operation." The usual routine examinations and preoperative care cover the extraction of diseased teeth and the treatment of pyorrhea pockets; the elimination of frank tonsillar and nasal sinus disease; the reduction of the urinary and blood sugar to the lowest point consistent with organic safety in the diabetic patient; the reduction of excessive blood pressure and improvement in the faults of intestinal and renal elimination which so often underlie this; the assurance of the patency of the tear ducts and the cleanliness of the conjunctivae and, in the presence of any history of genito-urinary disease, the elimination of any residual infection of the deep urethra or prostate, checked by a blood Wassermann reaction. I try to insist on referring the patient for a searching general examination when incipient cataracts first are recognized and, particularly in complicated cataract, with the examination to include a study of intestinal function and flora.

The treatment of this form of iritis, apart from the prompt discovery and elimination of its cause whenever possible, includes the vigorous use of atropine, hot compresses and ethylmorphine hydrochloride, high

doses of salicylates and sodium bicarbonate to the point of tolerance, and the beneficent relief to pain and inflammation given by carbon filament lamps and the use of antidiphtheritic serum intramuscularly in full doses, with the usual anaphylactic precautions as to history, asthma or previous dosage. I have the impression, from experience with iridocyclitis following penetrating wounds, that roentgenotherapy may not be wise until the normal viability of the cornea is restored.

4. *Exogenous Iritis.*—This form of postoperative infection has an incidence in recent reports of from 0 to 12 per cent according to the methods used, the number of cases reported and the skill of the operator. Infection practically never is implanted within an eye at the time of operation done under modern conditions. Experience indicates that such infections chiefly arise from the tear duct and the conjunctival secretion; that they first involve the lips of the wound, and that the spread of infection clearly is down through the depths of the wound into the anterior chamber, finally involving the uvea, to produce a terminal panophthalmitis if unchecked. Cataract extraction never is attempted in modern practice without the assurance either of the bacteriologic normality of the conjunctival sac or of the rendering harmless of any adventitious organisms by the preliminary use of silver salts as detailed by Bell[1] before this section in 1921 and confirmed by Linder and others. Infected tear ducts always are extirpated. No lesser measure is either safe or sound.

The safety of an eye from infection from without, or from extrusion of its contents, depends on the type of incision and the treatment of this incision. Incisions in the cornea, fortunately nearly obsolete, are not covered by surface epithelium for between two and three days, or even longer if individual defects in wound repair exist. The anterior chamber often does not reform for hours or days in this type of wound, and every opportunity is afforded for bacterial invasion. Here, as in simple peripheral incisions, a thin fibrinous plug is the mediate means of union of the lips of the wound and offers little or no resistance to pressure from without or within. An unsutured wound with a small tongue of conjunctiva, or with a full conjunctival flap, affords successively better protection, as the adhesion of the flap often is prompt and permanent. At other times, however, adhesion is irregular and delayed, and even eversion of the flap may occur. Prolapse of the iris or of the vitreous and incarceration of portions of these structures, or of lenticular or capsular fragments, between the lips of the wounds in the unsutured cases are the usual direct means by which infection enters the eye. Prolapse and incarceration of these structures, and secondary infection, can and do occur in wounds which are only partially sutured, but they become practically impossible with the full and accurate closure of the wound by a small flap which completely covers it and which is sutured by as many sutures as may be necessary to produce accurate apposition of the deep scleral wound and its conjunctival covering.

The application to cataract surgery of the sound and vital surgical principles which underlie the suture of surgical wounds in general is inescapable. The general surgical ideals that all presumably clean wounds shall be fully closed without drainage in order to prevent infection of the wound from without, and that wounds made and closed in more than one plane afford less chance of infection, are surer protection against hernia of the structures which they enclose and are stouter, find their fullest realization in cataract surgery in the use of the full conjunctival flap and its complete suture. Another general surgical ideal is realized by this means in that full suture completely restores the relations of the ocular coats and contents which have been unsettled by operation and fixes them in these relations. Operation without suture violates each of these canons of sound practice. Bitter experience forced the trial and proved the protective value of conjunctival flaps in corneal injuries and operations, sclerectomy, corneal fistulas and discissions, and the need for the provision and maintenance of such protection in the longer, severer wounds of cataract extractions should not require any special pleading. The literature is full of such masterly statements as "Early adhesion of the incisional margin is the best guarantee of a successful operation," "The result of a cataract operation depends upon the rapid and permanent closure of the wound," and "The chief function of the conjunctival flap is to serve as protection against infection." The beauty of the song apparently too often is lost in the charm of the singer!

Misstatements concerning the irritative effect of sutures, the time required for their insertion and the difficulties of their removal are the result of inexperience. It should be stated positively that sutures cause little or no irritation, even after weeks of retention. It is common practice to allow sutures to cut out by themselves, which usually occurs between four and twelve days, most sutures appearing on the dressing without the patient's knowledge. Infection of the suture line, such as occurs in dermal sutures, has not been encountered. Time and individual use will resolve the details as to whether the interrupted suture, the untied suture such as Berens has introduced or the buttonhole suture will best fill the surgical requirements of the particular case, but the main issue is to be sure that the deep wound is fully, firmly and permanently covered.

Infection occurring in a wound after cataract extraction and spreading into the eye should be met with the free, half-hourly irrigation with Locke's solution; the forced use of antidiphtheritic serum beginning with from 1,000 to 5,000 units according to the degree of weakness or senility of the patient and repeated daily just short of anaphylaxis; the use of the carbon filament lamp every two to four hours, and the usual measures of atropine, White's ointment and high doses of salicylates as indicated. Injections of milk have been uncertain and unsatisfactory in my hands. Intravenous injections of mercurochrome, as suggested by Duggan,[2] may be used if improvement does not follow the ordinary treatment. Many cases will be saved by these measures which formerly would have been considered as beyond hope.

II. PROLAPSE OF THE IRIS FOLLOWING CATARACT EXTRACTION

1. *Primary Prolapse of the Iris.*—This condition occurring at the time of operation is not rare and usually has no meaning beyond the fact that the operator has persisted in his fixation of the globe a little too long and too heartily. At times, however, the iris follows the blade up through the sclera, particularly with a deep incision, and rolls out like omentum to interfere with further manipulation until it has been pulled well out, excised and replaced before one proceeds with the extraction.

1. Bell, G. H.: New Method of Preventing Postoperative Intra-Ocular Infections, J. A. M. A. **77**: 1096 (Oct. 1) 1921.

2. Duggan, J. N.: Am. J. Ophth. **11**: 39 (Jan.) 1928.

2. *Secondary Prolapse of the Iris.*—The extreme variability of reported incidence in secondary prolapse depends on the type of operation, the operator, and the degree of refinement of interpretation of the term "iris prolapse." Generally it is agreed that, in average hands, prolapse of the iris occurs most often after simple extraction, somewhat less after intracapsular extraction with forceps and least often in the combined extractions. Full suture, in my experience, is preventive. The causes of prolapse of the iris in unsutured wounds are (*a*) trauma, (*b*) defective incisions, (*c*) delayed healing and (*d*) the omission of iridectomy.

(*a*) The traumatic sources of secondary prolapse are mainly those which unsettle normal relations within the globe. They include that heavyhandedness of incision which often causes immediate presentation of vitreous; excessive pressure in attempting delivery through too small an incision; the pressure of defective dressings; meddlesome inspection of the wound before its lips have united, and the myriad assaults and strains to which convalescents may be subjected. The tendency to put undue pressure on the eye during incision becomes less with experience. The prevention of excessive pressure in delivery is accomplished by planning the incision with regard to the size of the cornea and the cataract, a relatively larger incision being needed with small corneas. Too small an incision becomes evident on engagement of the cataract in the wound. Expression should be stopped and the wound enlarged laterally with scissors. It is a cardinal surgical rule that all incisions must be sufficiently large to permit manipulation through the wound without restriction. A large incision in cataract surgery simplifies the operation at every step, especially in cases in which full suture concludes the operation.

There is no prevention against prolapse of the iris in unsutured wounds from the effects of coughing, sneezing, vomiting, convulsions, delirium and the unnumbered sources of local injury. The literature is brimming, on the other hand, with case reports covering the most spectacular and dramatic situations through which many patients have passed without scathe owing to the protection given them by suture. I cannot see how, in the face of the accumulated evidence, a surgeon can avoid giving his patients the safeguards, and himself the mental ease, which this simple measure affords.

(*b*) Defective incisions often provide the point of least resistance for prolapse of the iris. The plane of the incision usually is curved or angular in section, with the concavity forward, regardless of the intention of the operator. A sharp change in direction often is forced, if the blade is entered or carried too far posteriorly, in order to avoid the excessive bleeding and obstruction to vision and manipulation caused by too long scleral or conjunctival flaps. Weak points in the wound are thus created at these incisional angles and, unless these points receive special attention, they remain as potential sites of prolapse.

A normal incision which provides ample exposure and suitable protection later includes not less than the upper third of the cornea and both at puncture and counterpuncture is placed sufficiently back of the limbus to provide enough conjunctiva for well anchored, horizontal sutures at or near each angle of the wound, the angles being especial danger points of prolapse. A modest but not excessive conjunctival flap is thus formed as the blade rises. Just before the blade emerges from the sclera above, it may be directed slightly backward to fashion a short scleral tongue, which, in the sutured wound, gives the effect of mortising and of greater strength. Regardless of the skill of the operator, however, no two conjunctival flaps ever are quite the same. These irregularities of incision determined my adoption of the interrupted suture as that form of suture best adapted to fit and hold these scleral faults accurately together, by changing the line of suture stress or tension to meet the requirements of the particular case. Primary union has been invariable, in my experience, regardless of the accompanying complications; and whether the absence of expulsive hemorrhage in 402 consecutive cases is in relation to the prompt restoration of intra-ocular form and pressure which occurs with full suture will require a still larger material to determine. Never less than three or more than six sutures have been required, with an average of five. They are placed immediately after the incision, while the cut of the flap and the possible incisional faults are clearly in mind. The first to be inserted are placed horizontally at each angle. These are the most important sutures, in my opinion, for the prevention or limitation of iridic and vitreous prolapse mainly depends on them. The next suture in importance is at the apex of the flap, which, unless precut, is seldom straight angled. Usually two other sutures are required, one on each side between the angles and apex and placed with regard to the angling of the scleral wound, if present. It seldom requires more than two minutes to place these sutures and to loop them away from the wound, this time being further occupied to great advantage by the instillation of sterile cocaine and epinephrine solutions into the wound, whereby direct and marked intra-ocular anesthesia and an almost complete control of intra-ocular bleeding are obtained. At times, in nervous patients, the flap momentarily is raised enough to insure the penetration of the anesthetic into the anterior chamber.

The reasons which underlie the use of multiple sutures in cataract surgery are partly surgical and partly mechanical. A consideration of the latter shows that the eyeball, when opened by the usual cataract incision, tends to gape most at the center of the incision, where the relatively unopposed action of the vertical recti is greatest. This accounted, in the days of simple extraction, for the prevalence of iritis and of iris prolapse beginning in this region. The removal of the iris at this point of especial pathologic involvement, introduced by von Graefe, notably lessened the incidence of iritis and prolapse but was not curative, for the tendency to gape was unmodified and into this area came tags of capsule, ligament, lens and vitreous to prevent or delay healing and to keep open a clear pathway for infection or for further extrusion. A single corneal suture, fearfully used, was the first curative step. It often was difficult to insert; often it cut its way out or caused local necrosis, and frequently it added further irritation to the usually painful corneal incision. This lessened but did not eliminate the iridic complication, for when a central vertical suture is used, the tendency to gape is transferred, in lessened degree, to the uncovered wound on each side of the suture. The angles of the wound, in a smooth incision without defect, being the most deeply placed part of the wound, offer the easiest point of exit for the unstable iris, even in the presence of peripheral or other iridectomy. An absolute equality of depth of these angles is impossible of attainment and the deeper, naturally, is the more vulnerable. Irregularities of incision, chiefly in the form of sharp angling, occur midway between the angles and apex of the inci-

sion and offer the final insecure points of the wound, especially as the tendency to gape now is most apparent at these points when sutures have already been placed at the angles and apex of the incision. Practically this redistribution of the gaping tendency as the result of successive sutures is overcome, in the ordinary case, by the complete apposition of the lips of the sclera which results from the average use of five sutures. Such a wound, protected from infection from without by a living membrane and splinted by the immediate agglutination of a firmly sutured layer of conjunctiva above it, becomes practically impregnable at once from without or from within. Ellett,[3] speaking of his results with a single suture, confirms the expressed opinion of many earlier writers:

> My experience does not warrant the view that the stitch prevents iris prolapse. I think that it does give a relative insurance against prolopse. When prolapse of the iris occurs after the use of the single control suture, it occurs to one side and is limited in its extent. Its excision is easy and safe as compared to a similar procedure with the whole wound more or less distended by protruding iris tissue.

Howard[4] corroborates this view in his paper on the Verhoeff suture, read before this section in 1924, by his remark, "A few small prolapses have occurred among our cases." Four cases of iridic prolapse have occurred in my practice out of 402 operations for cataract in which flap and suture were used. None have occurred during the last two years and all came during the period of routine use of three interrupted sutures placed without particular regard to incisional irregularity or to the gaping stress which is individual for each wound. All four cases occurred in the left eye, and three were technical faults with sharply angled incisions. The fourth followed long, repeated and intense straining to overcome acute urinary retention. The operative technic had been correct in detail. Prolapse occurred at the temporal angle of the wound and eventuated in a blind eye after the formation of dense pupillary membranes which resisted discission and repeated iridotomy. I feel certain that this could not have occurred had my present practice of placing secure horizontal sutures at each angle of the wound been in effect.

Possibly the most beautiful sight in eye surgery, next to that given by an uncomplicated intracapsular extraction, is the almost automatic restoration of the parts of the anterior segment to their normal relations which accompanies the tying of the sutures, especially after peripheral iridectomy has been performed. The sutures at the angles invariably are tied first and before replacement of any sort is attempted. The sphincteric action of the iris becomes of great aid from the moment that the angles are freed of iris or other matter by spatula or irrigator tip. Inclusions in the wound are suggested by retractions or distorsions of the normal circle of the pupil. Full restoration of relations occurs when the anterior chamber is reformed by the irrigating fluid, which gives a final advantage of forming and maintaining a fluid buffer between the iridic root and the angle of the anterior chamber.

It has been my practice to place my buttonhole iridectomy directly behind the center of the wound just after inserting sutures. This is done because it is difficult or impossible to perform this type of iridectomy should vitreous be lost, and it also affords a valuable means of irrigating through the pupil from behind. The sole disadvantage, that the lens often engages in the iridectomy opening, is minimized if Barraquer offset iris forceps are used. This has very small teeth which bite the iris finely, and Barraquer-Liebold scissors make the excision of a small and peripheral disk of iris simple. If engagement actually occurs, the well anesthetized iris merely is lifted over the edge of the lens by Kalt forceps without sensation or injury. A particular feature of the toilet, when sutures are used, is that it need not be hurried in the sense of precipitation, a matter of extreme importance in the face of such a difficulty as the loss of vitreous. Here, instead of the lids being quickly closed and the operation ended, the sutures, already in place, are tied carefully, closure of the angles of the wound usually being sufficient to check the prolapse. The central suture next is tied. These three fixed points of closure of the wound are now seen effectively to have reformed the globe; the vitreous retracts, and any which remains in the unclosed remainder of the wound is wiped away or cut off. If the iris has prolapsed with the vitreous, it is now replaceable or excisable, an impossibility without suture. Immunity from further prolapse, from delayed healing and from infection is practically assured when the remaining sutures are tied. If the vitreous opacities which are noted after loss of vitreous are the expression of an iridocyclitis, as suggested by Knapp, this may be the effect on the iris of the irritative drag or pressure of vitreous or may represent infection introduced through unsutured wounds. Should this last supposition be a reality, it should be largely eliminable by the use of complete, immediate suture.

(*c*) Delayed healing and reopening of wounds, which plays so important a part in the production of secondary prolapse in unsutured wounds, loses its significance with the routine use of sutures. Usually it is the result of inclusions and only rarely the expression of trophic changes peculiar to the individual. These inclusions do not exist at the time of finishing the normal toilet and, with full suture, there is no opportunity for them to occur later. Full suture gives a total exemption from the downgrowth of surface epithelium into the anterior chamber and a complete assurance against secondary glaucoma arising from this source.

Should separation of the deep wound occur beneath the conjunctival flap and an iris prolapse result, it should be treated expectantly for several weeks for, as noted by Payne,[5] prolapse which actually occurs beneath a conjunctival flap may return to the anterior chamber spontaneously even after so long a period. Apparently the new chamber thus produced remains in connection with the interior of the eye and keeps the iris bathed in aqueous, thereby preventing adhesion.

The treatment of prolapse of the iris and its consequences in unsutured wounds is a matter of very thorough record, such as may be found in the paper on this subject by Bulson,[6] read before this section in 1925. Ellett's[7] discussion of the subject also is of value. The preventive aspect of effective anesthesia was comprehensively treated by O'Brien[8] in a paper read before this section in 1927.

(*d*) The omission of iridectomy in the form of simple extraction causes the highest incidence of iridic prolapse in unsutured wounds. The buttonhole iridec-

3. Ellett: Contributions to Ophthalmic Science, 1926, p. 242.
4. Howard, H. J.: Conclusions Concerning a Scleroconjunctival Suture in Cataract Extraction, Tr. Sect. Ophth., A. M. A., 1924, p. 208.
5. Payne, S. M.: New York M. J. **115**: 466 (May 19) 1922.
6. Bulson, A. E., Jr.: Prolapse of Iris After Cataract Extraction, J. A. M. A. **85**: 322 (Aug. 1) 1925.
7. Ellett: American Encyclopedia of Ophthalmology **1**: 182.
8. O'Brien, C. S.: Local Anesthesia in Ophthalmic Surgery, Tr. Sect. Ophth., A. M. A., 1927, p. 237.

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tomy, introduced by H. B. Chandler in 1890, at once reduced this incidence. Whether it will again be possible to resume the free performance of simple extraction without iridectomy, with the safeguards given by complete suture of a full conjunctival flap, must be a problem for thorough clinical test. Theoretically, it should be the next step in expert cataract surgery. Contraindications to such an operation always will exist in the cases of the prominent globes of high myopia and exophthalmos, hard cataract in myopia, rigid irides, high pigmentation of the iris, and fluid vitreous.

In the light of the foregoing, and of my own experience as surgeon and teacher, I would modify the wise conclusions which Parker and Ellett have reached from their years of valuable work in cataract surgery into the statement that "the safest method of cataract removal for one to use in one's early years of ophthalmic surgery is the combined method," with capsulectomy, irrigation of the anterior chamber, and complete closure of the wound by conjunctival flap and suture, "leaving the other and usually more difficult methods until experience, and the increased skill and better judgment that come from experience alone, indicate when they may be used to advantage."

SUMMARY

The treatment of the incision in cataract surgery until recently has been out of line with the treatment of all other presumably clean operative wounds in which the fundamental practice is full suture of the wound in order to prevent infection and to restore normal relations.

The failure to suture these operative wounds of the eyes has been the greatest single means of infection from without and of extrusion of the intra-ocular contents, with their serious inflammatory and visual sequelae.

Covering of the wound by a narrow but complete flap of conjunctiva, formed during the incision, or preformed, fully closed over the sclerocorneal wound and securely maintained there by an average of five interrupted sutures, placed with regard to individual wound peculiarities, is preventive of these disasters in modern cataract surgery.

609 South Grand Avenue.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. FRANKLIN AND CORDES AND DR. MILLS

DR. WILLIAM H. WILDER, Chicago: There can be no dissent from the propostion that postoperative infections are of either endogenous or ectogenous origin and that those of the latter variety should be eliminated by suitable prophylaxis. On the subject of technic, there will probably be some difference of opinion. I think that the wearing of gloves by the operator in cataract operations, iridectomy or other glaucoma operations is an unnecessary refinement, and I know that the gloves obtund that fine sensation in the fingers that I want in such delicate operations on the eyeball. However, the hands of the assistant should be gloved, for he is to prepare the sponges and may touch things that have to come in contact with the field of operation; but if the operator uses reasonable care nothing that he touches with his ungloved hands need come in contact with the field. It is different in cases of plastic operations on the lids, enucleations, or muscle operations, or in any operation in which one is likely to touch the field or some object that is to come in contact with the field. In such cases the surgeon should wear gloves. I quite agree with the authors that the wearing of cap and mouth and nose mask is an essential part of good prophylactic technic. There is little doubt that even the normal conjunctiva is practically never free from micro-organisms, and it is our duty to determine if possible the number and the character of those that are present. Those found in greatest frequency, *Bacillus xerosis* and *Staphylococcus albus*, may be saprophytic and inert as long as they remain on the conjunctiva but may develop marked pathogenicity if introduced into the eye, particularly into the vitreous. The more virulent organisms like pneumococcus, streptococcus, diplobacillus and *Staphylococcus aureus* may be there but may not manifest their presence by any clinical signs. The conjunctiva may have harbored such virulent organisms long enough to have become more or less resistant or immune to them and not show any signs of infection. For many years it has been my routine practice in every case in which the eyeball is to be penetrated to test the conjunctiva at least twenty-four hours before the operation by culture on blood agar slants made from scrapings from the conjunctiva around the inner canthus, the semilunar fold and the canaliculi. If at the end of twenty-four hours there is any growth, and it proves to be pneumococcus, streptococcus, diplobacillus or *Staphylococcus aureus*, the operation is postponed. The treatment consists of the application of mild silver protein to the everted lids, and the use by the patient of 1 per cent solution of mercurochrome-220 soluble, or a collyrium of mercuric oxycyanide, 1:5,000, to be used several times a day. By these means one can make the conjunctival sac temporarily sterile. The importance of discovering any foci of infection that might play a rôle in endogenous infections should not be overlooked. I am in accord with the views of the authors on the management of the case should infection, either ectogenous or endogenous, occur. If foreign protein is used, typhoid vaccine is preferable to milk. In my experience its use has been followed at times by most gratifying results.

DR. H. W. WOODRUFF, Joliet, Ill.: I believe in the conjunctival suture. One of the important things about the cataract operation is not to be too long about it. Conjunctival sutures are not so easily placed. After they are in, they have all the advantages which Dr. Mills claims; but the placing of them is some hazard. The speculum must be discarded for the lid retractor. In order to place five sutures one must make a scleral incision throughout, which is neither always possible nor always advisable. One should have short sutures of proper size. Suture does not always prevent prolapse of the iris, but it adds greatly in security. There should be as little irrigation of the anterior chamber as possible. It is better to do the Barraquer operation than too much washing or other manipulation to free the chamber from lens cortex. Avoid what one might call puttering. The more one "weighs and considers" the possible consequences of iris involvement in the combined cataract operation, the more one is inclined to consider some safe method of intracapsular delivery, with peripheral iridectomy and suture. Reactive processes are not necessarily inflammatory processes. I believe that foreign protein is of great help in the prevention and treatment of some postoperative reactions. Milk is of value in the purulent infections, and diphtheria antitoxin in the sympathetic type, and perhaps also autohemic treatment. If pus infection is present and discovered early the eye can be saved by orbital injections of a solution of mercuric cyanide, from 8 to 10 minims (0.5 to 0.6 cc.) injected through the outer culdesac. Peripheral iridectomy should be done when possible. The only reason why a complete iridectomy may prevent iris prolapse is that there is not so much iris to prolapse. There may be prolapse, but there is not so apt to be protrusion. Herman Knapp reported 7.6 per cent of iris prolapse in simple extraction; Becker, 5 per cent; and Chandler, 12 per cent with his peripheral iridectomy. Elschnig says that peripheral incision of the iris will almost surely prevent prolapse. Maximum dilatation of the pupil with eucatropine and cocaine prevents the involvement of the iris by the knife during the incision. Physostigmine after operation is of great advantage when the sphincter has been preserved whether in the capsulotomy or in intracapsular operation. Prolapsed iris should not be cauterized. Sympathetic ophthalmia may follow such a procedure. Prolapsed iris is better removed if possible, although some very extensive prolapses may atrophy and the final condition of the eye resemble an iridectomy with a more or less updrawn pupil.

DR. L. H. LANIER, Texarkana, Texas: The relative incidence of cases of cataract in the United States as compared

with India and other far Eastern countries, all things being equal, leads to a greater proficiency in operative technic of the ophthalmic surgeons of those countries. I am convinced that the average operator in the average city should send his patients with cataract to an operator whose training and experience and location offer to the patient a degree of safety in keeping with the gravity of this condition. Drs. Franklin and Cordes do not make any reference to cutting off the cilia in preoperative preparation. This procedure it would seem is as important in cataract operation as the removal of hair before operation in other localities. The blood pressure should be taken and reduction of high pressure accomplished before operation if possible. No other operation requires so much preoperative preparation. I prepare all my solutions, anesthetic and antiseptic, and personally supervise the sterilizing and handling of instruments and dressings. This I should prefer not to do, but one enjoys a measure of safety by this method that otherwise might be lacking. The use of 1 per cent mercurochrome prior to operation has proved better in my hands than 1 per cent silver nitrate one hour before operation. I consider suturing the conjunctival flap good practice and if postoperative infection occurs, diphtheria antitoxin in large doses is the treatment *par excellence*. I agree with Dr. Wilder that mercuric chloride solutions are extremely irritating to the conjunctiva.

DR. R. H. T. MANN, Texarkana, Ark.: Eyes are still too frequently lost from late infections following cataract extraction as the result of some focus of infection having been overlooked at the time of or before the operation. An eye of this kind was seen only a few weeks ago which had been lost following a perfectly good extraction. When an examination was made, the patient was found to have a mouthful of decayed teeth. I am of the opinion that rubber gloves should be used as a routine in all ophthalmic operations. Every one knows how hard it is to render the hands surgically clean. If the general surgeon can use gloves in grafting nerves and uniting blood vessels, there does not seem to be any valid reason why the ophthalmic surgeon should not develop the same technic. A sad experience many years ago forced me to adopt the use of gloves as a routine in all my operations. Even in cataract extraction one cannot always select the time of operation, but must sometimes operate under the most unfavorable circumstances. A case in point is that of a young man with a perforating injury of the cornea with marked increase of tension, who suffered so much pain that it prevented him from sleeping for nearly two weeks except under the use of a narcotic. The eye had an ulcer at the place of injury. The question was whether to enucleate the eye or to evacuate the lens and try to save the globe. The lens was evacuated and the incision healed by first intention. The only remedy used in addition to the ordinary treatment of this eye was the instillation of a 1 per cent mercurochrome solution before and after the operation. Is mercurochrome a better antiseptic than we have been accustomed to use, or are we ever to have one which will render operations safe in the presence of infection? That is an unsettled question. Anyway this eye healed as if no infection had existed. It may have been an accident.

DR. CHARLES N. SPRATT, Minneapolis: The fifty-odd pages in the presession volume on the complications of the cataract operation might well be condensed into one short sentence: Use the same surgical methods in the cataract extraction as are employed in the operations on the abdominal or cranial cavities. For several years I have applied the general principles advocated by Dr. Mills with two important differences. First, following the idea of Czermak, a pocket flap of conjunctiva is employed instead of one with free edges. Second, the suture is inserted before any opening is made in the eye. I am convinced that if this method is followed, exogenous infection will be no more likely to take place than in operations on the abdomen. Endogenous infection is a rare complication.

Complete anesthesia is necessary in order that the patient may not squeeze and cause prolapse of the iris or vitreous.

Avoid trauma. The pocket flap enables one to secure a large incision and fixation of the eye is made by means of it. During the expression of the lens, this flap is pulled forward, and prevents sudden movements on the part of the patient. By this traction, the lens is more easily expressed; thus the iritis due to trauma and prolapse of the iris or vitreous is avoided.

By the removal of the lens in its capsule and careful irrigation with physiologic solution of sodium chloride, no nonviable tissue is left behind.

The layer suture made by the conjunctival flap accomplishes the same purpose as the suture of layer by layer, for hernia. This suture not only prevents vitreous loss at the time of operation but also reduces entirely the danger of late infection or prolapse due to injury or straining on the part of the patient. This pocket flap leaves no open angles to the wound; should an accident occur, there is a subconjunctival prolapse or iridotasis—the operation for relief of glaucoma.

Hemorrhage may be largely prevented by placing small pledgets or cotton saturated with epinephrine or better still with a thromboplastic preparation in the conjunctival pocket before the eye is opened. Following this type of suture flap, the wound is as completely healed at the end of twenty-four hours as it is in the ordinary extraction at the end of several days. The patient may sit up in a chair the day following the operation, and the bandage may be removed in from twenty-four to forty-eight hours.

DR. WILLIAM C. FINNOFF, Denver: One of the important points in the prevention of cataract complications is the proper sterilization of instruments. For those who work in special eye hospitals the management of rather delicate instruments is not a problem, but for those of us who are compelled to work in general hospitals and depend on nurses who are rotated, the proper sterilization of instruments is a serious problem. We have all had sad experiences in the sterilization of instruments; we have had knives ruined and other instruments made unfit for use. This can all be avoided by the use of dry sterilization. Since visiting the Morax clinic I have adopted dry sterilization for all instruments used in intra-ocular operations. The instruments are placed in a metal box and covered with wrapping paper; the knives are placed in test tubes, and then sterilized by dry heat at 160 C. for a half hour. The instruments are clean and dry; there can be no doubt about the condition of the instrument because it can be seen, and it is not exposed to the dust of the operating room. The container is opened at the time of operation and dry instruments are ready for use—a distinct advantage over wet instruments. I recommend this method for your use. The one disadvantage is the necessity for having three or four sets; but when we consider the saving in replacing instruments that are ruined by neglect in sterilization, this does not mean so much. With dry sterilization there is no reason why instruments should not last a lifetime.

DR. O. B. NUGENT, Chicago: While it is desirable to have a clean mouth before operating for cataract, it would seem that infection after a cataract from this source is exceedingly rare. I make a bacteriologic examination of the conjunctiva before all cataract operations. An experienced cataract operator certainly would not operate on an eye with an inflamed conjunctiva, and the clinical appearance of the condition of the conjunctiva is usually all that is necessary, as investigators have found it impossible to sterilize the conjunctiva. I disagree with the authors, however, as to the practice of removing the bandage and inspecting the eye within twenty-four hours. To my mind this is totally unnecessary and has no advantage. Iritis, iridocyclitis and iris prolapse are postoperative complications that every cataract operator dreads. One is reminded that a large percentage of these complications are due to the presence of either cortex or capsule. He states that prolapse of the iris at the time of operation is not rare and usually has no meaning. It should be remembered, however, that an iris prolapsed during operation has a tendency to recur later. In attempting to reduce iris prolapse, one should remember that this occurs only when there is a leakage of the wound and that any measure that will tend to prevent this condition will also tend to lessen the percentage of iris prolapse. This percentage is greatly reduced by the conjunctival suture, as he states, and one prolapse in 100 operations, where sutures were used only, as stated in the paper, goes to show that the conjunctival suture has its place in cataract surgery, and further, that Dr. Mills has a light hand and is a finished operator. Any good operator would be proud of such a record. As the author states, peripheral incision and peripheral iridectomy have a great influence in the reduction of postoperative complications.

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In suturing a conjunctival flap it has been my custom for the last two years to place a suture in the center of the conjunctival flap and to take one or two sutures on either side to lessen the possibility of iris prolapse. It is much easier and safer to tie the sutures over forceps than to tie them with the fingers.

DR. F. PARK LEWIS, Buffalo: There are two points that both the speakers mentioned that will bear a moment's consideration. The removal of the infected sac prior to extraction in an old patient is not a simple matter. I have found that by injecting the sac with silver nitrate and tying off both canaliculi I have succeeded in avoiding infection. In old people this is certainly worthy of consideration. The second point is the use, intravenously, of mercurochrome, as suggested by Young. In an apparently moribund patient having marked iridocyclitis not only did the patient recover but the eye was left in good condition. This remedy is so valuable in otherwise hopeless cases that I am surprised that it has not been more generally employed in septic infections. Another little point is the use of isinglass plaster over the brow during the operation, thereby shutting off the liability of infection from the hair.

DR. JAMES W. MAY, Kansas City, Kan.: The most valuable procedure after infection has developed is subconjunctival injection of mercuric cyanide. Certainly many patients will be saved in whom other forms of treatment will not suffice. In the prevention of infection following intra-ocular operations I should like to stress nonspecific protein therapy. I have used this treatment in several cases following cataract extraction. We are led to believe that the wound heals more kindly, and that the remaining cortex is more quickly absorbed with much less reaction, and consequently with more feeling of safety and security. I should also like to call attention to an accident which might intervene if one wears a mask over the mouth and nose. It happened to me; when the knife was in the anterior chamber my glasses became covered with moisture from the nose. One can readily imagine what might occur. In this particular case the glasses were quickly removed and not being very presbyopic it was possible for me to complete the dissection. I would advise the use of sodium salicylate intravenously. Certainly one gets from the average dosage quicker and more intense action. I think we shall all get better results when a thoroughly competent internist has made a complete physical examination and given proper preliminary care and treatment.

DR. HARRY S. GRADLE, Chicago: In the Prague clinic it was found that 43 per cent of cataract patients with normal appearing conjunctival sacs showed organisms of the pneumostreptococcic variety which under cultural conditions became virulent. We know that organisms of this variety may lie dormant in a normal appearing conjunctival sac, because when they do become virulent these organisms have gained admission to the epithelium or the intra-epithelial layer. Lindner has shown that infections of the conjunctiva are intra-epithelial infections, and consequently organisms may lie in the recesses of the culdesac, snugly tucked away in a warm, soft, moist haven, where they may remain dormant for a long period of time, merely awaiting a favorable opportunity to enter the conjunctiva or eye and start clinical manifestation of infection. We cannot obtain a true knowledge of the bacteriology of the conjunctival sac from smears or from cultures obtained by scrapings of the surface of the epithelium. The organisms are found mostly in the culdesac which we cannot enter with our platinum loops, and it is necessary that the culdesac be flooded with any sort of normal fluid, which fluid in turn is transferred to the culture medium. Under those circumstances and only under those circumstances do we obtain a true knowledge of the organisms that are present in the conjunctival sac. About a year after Elschnig's publication we investigated a good many cases of normal conjunctiva in cataract patients by cultures by the wet method, checked against smears obtained by the platinum loop. Of all the cases showing pneumostreptococci by the wet method, only about 50 per cent showed the organisms by the smear or dry method of culture.

Another little point in regard to iris prolapse after cataract extraction is that the motion of the patient has a great deal to do with it. We are operating on our patients in bed, using a special type of bed not having any head or foot, on fairly large rollers. The patient is rolled into the operating room, and after the operation is over he is rolled back, so there is absolutely no motion of the patient, and the wound has a chance to heal undisturbed by extraneous motion.

DR. WALTER S. FRANKLIN, Santa Barbara, Calif.: It is necessary to have some standard. We must teach coming ophthalmologists that they must employ a certain technic; otherwise such great variation would take place that one man would wash his hands for five minutes, the next would dip his fingers into an iodoform solution, and the third, finding he had no infection, would do practically nothing in the way of sterilization. Fortunately, the flow of fluids of the eyeball is from within outward, and there is sufficient pressure so that there is a constant drainage of the intra-ocular content. That is really what prevents infection in a majority of these cases. We all know how easy it is to have an infection following a discission. I do not wish it understood that we never make a bacteriologic examination; on the contrary: if the eyeball looks entirely normal, without particular conjunctivitis, the patient is not subjected to a bacteriologic examination; but when a bacteriologic examination is done the pipet method is used in preference to obtaining scrapings. The dry sterilization of instruments, as brought out by Dr. Finnoff, should receive special emphasis. In regard to the inspection of the eye within the first twenty-four hours, I, too, was taught that the normal eye should not be looked at for eight or ten days; that both eyes should be bandaged following the operation, the bandage on the unoperated eye being removed at the end of three days, and on the operated eye at the end of the ninth day. In one case I found a marked corneal infection at the end of the ninth day, and in other case I found an inversion of the cornea. Then I began looking at the eye at the end of twenty-four hours. The bacteria present are principally saprophytic and do not irritate unless there is stenosis of the sac itself. Within the last four years we have allowed each patient to sit up immediately following the operation. Letting him sit up gets away from the idea of his becoming a mummy for six or eight days, does away with cramped muscles and adds materially to his mental cheer.

DR. LLOYD MILLS, Los Angeles: The outstanding value of any measure which will eliminate the risk of squeezing, once the globe is opened by incision, justifies stressing the use of direct intra-ocular anesthesia. Most of us have dropped cocaine and epinephrine into the conjunctival sac during cataract extraction, in the hope that some might enter the anterior chamber. Very little does enter the eye, as a matter of fact, as the incision is placed on a plane which remains high and dry save for the momentary passage of the fluid over its lips. Most of this solution either runs out of the eye or is absorbed into the next sponge. The method of intra-ocular anesthesia followed by us produces a profound local anesthesia of the anterior segment which has not the least resemblance to the casual instillation of anesthetic into the conjunctival sac. It is the simplest, most effective form of anesthesia yet proposed, although somewhat difficult to do without the leverage of a conjunctival flap. My last fifty-two cases of cataract surgery, in all of which this method was used, included several cases of complicated cataract with strong synechiae, but, without exception, the anesthesia was the nearest realization of ideal surgical painlessness and bloodlessness which I have ever known. Local and general toxic results have been watched for keenly but have not been noted. Probably the single drop of epinephrine prevents any marked degree of absorption, and in any event little fluid remains in the anterior chamber when the rapidly following delivery of the lens occurs. The entire procedure of suture and anesthesia seldom requires longer than two minutes, which is of little account if the patient has had fitting mental preparation for operation and is anticipating precision of technic and not speed. It is not at all necessary to make a scleral incision in order to insert five or more sutures, as Dr. Woodruff suggests. But even if the incision is slightly scleral what does it matter? Scleral wounds unite even more firmly than conjunctival wounds. I have followed Elschnig's lead in the matter of pocket and bridge operations for cataract, as spoken of by Dr. Spratt, and have considered them applicable mainly to patients with corneal degenerative changes of keratitis, degeneration and ectasia.

THE ASCHHEIM-ZONDEK HORMONE TEST FOR PREGNANCY

PRELIMINARY REPORT *

HENRY W. LOURIA, M.D.
AND
MAXWELL ROSENZWEIG, M.D.
BROOKLYN

The desirability of a dependable laboratory test for the diagnosis of pregnancy has been recognized for a long time. The Abderhalden serum reaction, although giving great promise at first, has been abandoned on account of its unreliability. Other procedures, such as the epinephrine test, are likewise of slight value. In recent years, the isolation of the ovarian hormone and the discovery of the influence of the anterior lobe of the pituitary gland on the gonadal system has suggested the possibility that these facts might be useful in establishing the diagnosis of pregnancy.

Our purpose in this article is to report briefly our experiences with the Aschheim-Zondek test for pregnancy, which one of us (H. W. L.) had the opportunity of observing this spring in the laboratories at the Charite in Berlin. The basis of the test rests on the fact that during pregnancy, as pointed out by Erdheim and Stumme,[1] there are marked changes in the histologic structure of the anterior lobe of the pituitary gland. Furthermore, Smith and Engle,[2] and Evans and Long [3] demonstrated that the injection of anterior lobe of the pituitary gland into mice and rats caused marked enlargement of the ovaries. Aschheim and Zondek [4] confirmed these observations and discovered that during pregnancy there was a striking overproduction of the hormone of the anterior lobe of the pituitary gland, leading to its excretion in the urine. The subcutaneous injection of the urine of pregnant women into immature female mice was followed by striking alterations in the ovaries, manifested by swelling, congestion, hemorrhages and the premature maturation of the ovarian follicles. These changes were easily visible to the naked eye.

Results of Injections of Urine

Cases of Pregnancy	Number of Cases	Positive No.	Positive %	Negative No.	Negative %	Doubtful No.	Doubtful %
1. From 1 to 3 months	31	30	96	1	3	0	0
2. From 3 to 6 months	26	26	100	0	0	0	0
3. From 6 to 9 months	30	30	100	0	0	0	0
	87	86	98	1	1	0	0
Nonpregnant Subjects							
1. Male patients	5	0	0	5	100	0	0
2. Fibroids, ovarian cyst	5	0	0	5	100	0	0
3. Functional amenorrhea	18	0	0	18	100	0	0
4. Miscellaneous	17	1	5	13	76	2	19
	45	1	2	41	91	3	7

In performing the test, female white mice varying in age from 3 to 6 weeks were selected. The mice averaged from 10 to 15 Gm. in weight. Three-tenths cubic centimeter of urine from a specimen collected in the morning was injected subcutaneously three times each day for a period of three days. The mice were killed two days after the last injection and the pelvic organs were carefully examined. In order to exclude the possibility of bias, the necropsy observations were made by one of us who had no knowledge of the source of the injected specimen. As a rule, a group of mice were examined on the same day and always included control animals who had been injected with the urine of nonpregnant patients.

In all, 155 specimens of urine were examined. In twenty-three cases the mice died during the course of injections, either on account of the toxicity of the urine or from spontaneous disease. Of the remainder, eighty-seven specimens were obtained from women in all stages of pregnancy, varying from the first to the ninth month. The nonpregnant women whose urine was injected into the mice included patients suffering from fibroids of the uterus, ovarian cysts and functional amenorrheas, as well as normal women in the premenstrual and postmenstrual epochs and in the menopause. Specimens of urine from male patients were also injected as controls. The accompanying table gives the results of these injections.

In judging the results of the test, the only criterion relied on was the change in the immature ovaries as described; namely, swelling, congestion, hemorrhages and maturation of the follicles. There was invariably an associated enlargement and engorgement of the uterus and tubes, but in accordance with the views of Aschheim and Zondek this was interpreted as being secondary to increased ovarian activity. The ovaries, which in juvenile mice are small, pale bodies, became pinkish red and were often enlarged to three times the normal size. The hemorrhagic areas were frequently as large as the head of a pin and stood out prominently on the surface of the ovary. The prematurely ripening follicles were easily seen as small yellow spots.

SUMMARY

The Aschheim-Zondek hormone test for the diagnosis of pregnancy was carried out in 132 cases. Eighty-seven specimens came from women in all stages of pregnancy and showed a positive reaction in 98 per cent. The earliest case of pregnancy examined was in a woman whose menstrual period was seven days overdue. There were several other women in the first three weeks of gestation, all of whom showed a positive test. The importance in this type of case is obvious, in that a diagnosis of pregnancy is possible before physical examination is positive, thereby differentiating the pregnant uterus from the slightly enlarged nonpregnant uterus. The remaining forty-five specimens obtained from nonpregnant patients showed a negative reaction in 91 per cent. The test is recommended, therefore, on account of its high percentage of correct results and its simplicity. Further experience with the test will undoubtedly aid in reducing the element of error.

149 New York Avenue—405 Grand Avenue.

* Aided by a grant from the Dr. Leon Louria Research Fund.
* From the Department of Pathology, Jewish Hospital of Brooklyn.

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2. Smith, P. E., and Engle, E. T.: Am. J. Anat. **40**: 159 (Nov.) 1927.
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Cancer and the Public.—If the public is to receive the best which we have to offer in the control of cancer it is necessary that every locality have some special mechanism for the assembling of cancer patients. In some instances this may require the establishment of a special hospital or a large cancer service in an already existing one. In others it may take the form of a cancer clinic, such as those recently established in Massachusetts. For this work individual enterprises will scarcely be sufficient. It is likely that the best results will come from the cooperation of a group of which the internist is a member and in which the general practitioners have an active interest.—Barr, D. P.: Relation of Internist and Practitioner to Cancer Problem, *South. M. J.*, December, 1928.

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Clinical Notes, Suggestions and New Instruments

GOLF BALLS AS A SOURCE OF LEAD POISONING

H. W. WUERTHELE, M.D., PITTSBURGH

Accidental lead poisoning is much less important than industrial poisoning, and it is not as common as it was a decade or two ago. Nevertheless its sources are many, some evident, some unexpected and a few dependent on secret lead preparations that are often discovered only through the occurrence of the poisoning. This report, I believe, gives a new source of saturnism.

REPORT OF CASE

History.—M. B., a school boy, aged 16, white, consulted me at my office, Aug. 5, 1927, because of severe abdominal cramps that he had had for two weeks. At the time of examination he weighed 125 pounds (57 Kg.). His best weight at any time was 127½ pounds (58 Kg.), and his height was 5 feet 5 inches. He was born and had always lived in Pennsylvania.

The patient's father, aged 39, was living and well; his mother, aged 32, and his four brothers and two sisters were all living and well. One brother died of intestinal infection at 6 months of age. There had not been any mental or nervous diseases, malignant conditions or tuberculosis in the family or in near relatives.

The patient had had the usual diseases of childhood. He had not had rheumatism, chorea, typhoid, pneumonia, influenza or scarlet fever. Two years before he had been a diphtheria carrier for fourteen days. He had not had any operations, severe accidents or venereal infections.

Subjective Symptoms.—The cramps, starting from the lower quadrant of the abdomen, extended down the legs to the feet and lasted from five to ten minutes. These occurred at irregular times, and there were as many as from four to five paroxysms in a day. August 5, the cramps started while the patient was caddying at the golf links and lasted from 1:45 to 5 p. m. They were so severe that the patient was unable to walk and had to lie on the ground. He then started to walk home and had to hold the abdomen with his hands while walking. He did not have any vertigo, headaches or syncope. There was no cough, shortness of breath or palpitation of the heart, and nausea, vomiting and eructation were absent. The bowels were regular. Genito-urinary examination did not reveal burning, frequency or nocturia. There was no numbness, or tingling of the extremities. The patient complained of fatigue after the paroxysms.

Physical Examination.—The patient appeared fairly well nourished. The heart and the lungs were normal. The abdomen was retracted, boardlike and very muscular. Genito-urinary examination was negative. The skin was tanned, where it had been exposed to the sun; the rest of the body was clean and clear. There was no edema or cyanosis of the extremities. The thyroid gland was not enlarged; the axillary, epitrochlear, inguinal, maxillary and posterior cervical glands were all normal. The tonsils were not enlarged, and apparently were normal. The mucous membranes were of good color. The teeth were in very good condition. The nose apparently was normal. The eyes reacted to light and distance; the pupils were moderately dilated and equal. The sclerae were clean and clear and pearly white, and the media were clear. The optic disk and retina were normal in appearance. The Babinski and Romberg reflexes were negative, and the patellar and achilles tendon reflexes were absent; the Kernig sign was negative, and the biceps and triceps reflexes were absent. Coordination was normal, and there was no ataxia. The pulse count was 72. The blood pressure was 124 systolic and 80 diastolic.

The urine was a clear amber with a specific gravity of 1.025; it was negative for sugar and albumin. Microscopic examination did not show any casts or red blood cells. The red blood cells numbered 5,250,000, and the white blood cells, 10,150, with polymorphonuclears, 80 per cent; lymphocytes, 20 per cent, and hemoglobin, 95 per cent. There were no stippled cells seen; poikylocytosis and anisocytosis were absent. The Wassermann reaction was negative.

A diagnosis of acute lead poisoning was made.

COMMENT

This was a rather unusual case and I was at a loss as to its cause. The syndrome was that of lead poisoning and I questioned the patient closely as to the possible source of exposure to lead. After three days of questioning, I found that he had been cutting open golf balls and rubbing the lead contained in a little rubber sac onto old balls that he had found about the links and that he was preparing for sale to some of the golf players for practice balls.

I do not believe that this lead was absorbed through the skin. It is more probable that as the patient was in the habit of eating lunches, sandwiches, candies and cakes in a cafeteria on the links, the point of entrance to his system was through the gastro-intestinal tract from the hands.

The patient was given six intravenous injections of sodium thiosulphate at intervals of three days, the initial dose of 0.3 Gm. being increased 0.1 Gm. at each subsequent dose.

I last saw the patient, Oct. 20, 1928. The reflexes had all returned, and he had apparently made a complete recovery.

Schenley Apartments.

COPIOUS HEMORRHAGE FROM SPONTANEOUS RUPTURE OF CORPUS LUTEUM CYST

F. P. HAMMOND, M.D.
Associate in Surgery, Northwestern University Medical School; Attending Surgeon, Washington Park Community Hospital
AND
A. O. STEPHENSON, M.D.
Clinical Assistant in Surgery, Northwestern University Medical School
CHICAGO

R. B., a married woman, aged 22, who had been in previous good health, had had measles at 2, chickenpox and mumps at 6, whooping cough at 7, and typhoid at 9. In an automobile accident at the age of 14, two upper middle incisors were lost. Three and one-half years before examination she had had a miscarriage of a five months fetus. She had one living child, aged 22 months, who was healthy. Menstruation, of the twenty-eight day type and of three days' duration, began at 12. The patient's father was alive and well. Her mother had chronic interstitial nephritis.

Dec. 6, 1927, the patient was seized with acute abdominal pains, colicky in type and localized to the right lower quadrant of the abdomen. She also complained of nausea and vomiting and of a chilly sensation following the onset. She was admitted to the hospital, December 7, and operation was performed at once.

Examination showed some rigidity and definite tenderness over the right lower quadrant. Vaginal examination did not reveal any palpable masses in either fornix. Painstaking percussion, with turning of the patient from side to side, should have revealed evidence of free fluid in the abdomen. The last menstrual period, three weeks before, had been normal in time and duration.

The pulse rate was 80, and the temperature, 99 F. The urine was normal except for two or three erythrocytes and ten or twelve pus cells per high power field. The hemoglobin was 80 per cent; the erythrocytes numbered 4,200,000, and the leukocytes, 13,500.

A diagnosis of acute appendicitis was made and the patient was operated on, the muscle-splitting incision being used. The abdomen contained about 2 pints of blood-stained fluid and clots. The source of the hemorrhage was found to be the posterior surface of the right ovary, which was oozing blood from a rather sharply cut puncture wound of a corpus luteum cyst. The cyst was 15 mm. in diameter. The cystic portion of the ovary and the appendix were removed. The incision was extended and with strong traction the uterus and the left tube and ovary were observed and found normal. No other pathologic condition was noted in the abdominal cavity.

The patient made an uneventful recovery and went home on the eleventh day.

The bibliography of cases reported by the American College of Surgeons reveals the following preoperative diagnoses in cases in which there were similar symptoms: ectopic pregnancy, ten; appendicitis, six; undiagnosed, five; exploratory, four; autopsy, one, and intra-abdominal hemorrhage, two.

The pathologic examination of the specimen of tissue, appendix and ovary removed at operation was made Dec. 8, 1921, by Dr. J. J. Moore, who reported that the specimen consisted of: (1) the ovary with cyst attached which had been opened or ruptured; (2) several small ragged masses and fragments consisting apparently of clotted blood, and (3) an appendix about 5 cm. long that showed no signs of acute inflammation, grossly.

The sections of the appendix showed traces of chronic appendicitis. The ovary showed a recent ruptured corpus luteum; there were no definite evidences of extra-uterine pregnancy.

At a second examination, April 27, 1928, Dr. Moore reported that many sections had been made from different portions of the ovarian cyst and of the blood clots, and that those from the ovary showed a recently ruptured corpus luteum. No definite evidence of extra-uterine pregnancy was found in any of the sections.

CONCLUSION

While the diagnosis of a surgical condition of the abdomen is essential and life saving in such cases, nevertheless the proportion of mistaken diagnoses that have been reported, including our own, is, we feel, too high and those of us who have had such a case should in the future cause to be tabulated in this series some correct preoperative diagnoses of spontaneous rupture of an ovarian cyst.

6308 Cottage Grove Avenue.

Special Article

MEDICAL JOURNALISM AND SCIENTIFIC PROGRESS *

SIR SQUIRE SPRIGGE, M.D.
Editor of The Lancet
LONDON, ENGLAND

I owe the honor of addressing you to the fact that I happen to be the editor of a medical paper that has turned its centenary. My words tonight will be an attempt to show that, while the life of a hundred years may be a long one for any serial publication of a specialized or professional nature to enjoy—one, indeed, of which those responsible for its conduct may well be proud—it is brief and episodic in the history of medical journalism, if the earliest manifestations of this form of literature are taken into account. For medical journalism may be said to have been commenced 4,000 years ago, and at least one Babylonian tablet earlier than 6000 B. C. records a case of dropsy, for the instruction of sufferers. And without attempting to include in the back history of medical journalism the stone and metal inscriptions of the oldest civilizations, we may point to the tablets in the Aesculapean temples as collected records for medical use of clinical and therapeutic observations—and how better can medical journalism be defined?

A word about these tablets is necessary. As is well known, temples for the worship of Aesculapius were made the centers for votive offerings. These took the form of marble plaques on which were recorded the treatment administered, the results obtained and the gratitude of the patients for the information of sufferers and healers. If one regards modern medical journalism as records written by doctors for doctors, the analogy between these tablets and the medical journals of today, though not very close, is closer than appears, and for this reason: It used to be universally accepted that the priests in the Aesculapian temples were themselves the doctors and ministered to the sick, and that these priests were typical examples of that union of doctor and priest which has been found to exist in so many primitive civilizations—and something of which is manifested today in the stress which is laid on psychology and in the efforts of Christian science to achieve scientific recognition. The first clinical medicine was along the fundamental lines of modern physical therapy; diagnosis was made by physical examination, and the treatment took the form of hydrology, massage and sun exposure, showing once again that nothing is new under the sun. The result of the treatment was recorded and thus there were in fact two ministries, one of priestcraft and one of clinical balneology.

The tablets of the Aesculapian shrines formed the first effort of medical journalism. For whether the clinical cases were the grateful messages of the patients at the healing springs or of their medical attendants, they formed the nucleus on which Hippocrates and his followers constructed the Corpus Hippocraticum, that collection of medical treatises written by the father of medicine, his disciples and in a few cases his predecessors. This was the true beginning of medical journalism; and at that early date in medical culture clinical records became what they have been ever since, the source of systematic medical literature. Probably some of the priests of Aesculapius, as distinguished from the medical disciples, worked on lines of suggestion, as they are put in action at Lourdes today, while the more medical votaries practiced balneotherapy contiguously, and at this moment the two treatments are functioning at adjacent centers in the Pyrenees, for the valuable sulphur baths at Cauterets are separated by only a few miles from the famous shrine of Lourdes.

And as Lourdes and Cauterets can have no common message, so in early civilization the unscientific and the scientific could not work together. When logical Greece came to occupy superstitious Egypt, the association in Egypt between the priesthood of the temples of Hermes and the healing work was possibly closer, for theocratic government had been evolved to perfection in Egypt and the priests were obliged to practice medicine at their temples in accordance with the doctrines of Hermes. This implies that the records of the patients were kept or added to in order to suit theological doctrines, and accounts for the fact that by the time anything like real medical history emerges the canons of Hermes had been superseded by the Aesculapian code, so that when Greek civilization was established at Alexandria Hippocrates was recognized as a leader of thought.

What did Hippocrates learn from personal study, based on the collected tablets? In clinical medicine he laid down the first principles, disregarding superstition and recognizing the healing power of nature; he insisted on the value of note-taking and of recording experiences, while from his knowledge of Pythagorean mathematics he was led to see time sequences in the course of pathologic conditions. He recognized the influence of diet and the need for rules of living, and his descriptions of pathologic conditions, the outcome of direct observation, were vivid and must have come to the physicians of his day as a complete revelation. His notes on climate and his detection of the varieties of disease depending on telluric conditions suggest that he traveled much, and this is borne out by his treatise on Airs, Waters and Places, one of the most famous of the collection, and admitted as genuine by the severest critics. The essence of his work was note-taking, and its basis was the old clinical recording—the first jour-

* Read before the Medical Society of the County of Kings, Brooklyn, Nov. 15, 1928.

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nalism. Hippocrates describes infected and suppurating wounds accurately, recognizes the association of fevers with them, and refers frequently to the incidence of tetanus, and the prime source of his learning was undoubtedly the note-taking in the temples. In short, the Corpus Hippocraticum forms exactly that connection between medical journalism, regarded as note-taking at the time, and the writing of medical treatises later, which today is the method adopted for the diffusion of systematized medical knowledge; and when departures are made by medical authors from the sure foundation of experience, their own or that recorded by others, errors occur.

It may be that the great Galen, in Roman imperial days, constructed his treatise on clinical observations, his own or those stored up ready for classification, for it is known that he was educated at Pergamos, where Aesculapian tablets existed, and that in his determination to study medical science at the source he later made journeys to Greece and to Egypt, and no doubt wherever he went he observed. He is often spoken of as merely a student of Hippocrates; but he appears to have familiarized himself with all the developments of science, as well as with many surmises distinctly unscientific which characterized the long intervening period between himself and the father of medicine. In writing his textbook he was not relying alone on the work of Hippocrates, or on any definite medical records, but employed other arguments evolved to combat the many schisms which had arisen. He accepted the precepts and dogmas of Hippocrates to which more recent learning enabled him to add, but the newer knowledge seduced him into developments of theories and hypotheses which he was unable to support. His elaborate statements concerning the principal humors, the three kinds of spirits, the four main temperaments, appear now to have much complicated hippocratic doctrines, even though they may add something by suggestion, and the elaborations were not founded, as far as can be traced, on actual clinical records. It can be readily understood that Galen's general summary, showing that health depends on the harmonious interactions of physiologic processes, was a message that gave his teaching the supreme value for so extended a period, but much of the philosophy must have been founded on surmises, and for 1,500 years medicine suffered accordingly.

It suffered by as much as the teaching of Galen replaced that of Hippocrates, the man who theorized being preferred to him who relied on clinical history. So that while the actual experiences of physicians and their patients, as recorded at the time, were depended on—i. e., while accurate medical literature was the source of inspiration—progress took place in medicine at such a rate that today the teachings of ancient Greece are followed in many essentials and found to be true. But when mystical imaginings, unverified by experience or simultaneous records, came to be relied on, progress stopped dead. No one today talks in terms of Galen.

And dead medicine stopped for some 2,000 years. For nothing happened in the medical world that needed reporting for the instruction of physicians throughout the Dark and Middle Ages, except what may be termed the oriental episode.

I shall not refer to this—the Arabian School of Medicine—at any length. It was founded by the great Haroun Al Raschid, the contemporary of Alfred the Great and a familiar name to all who have read the Arabian Nights' Entertainments, and I may simply recall that at this epoch a hospital and medical school were founded in Bagdad, where records were kept of the patients, and subsequently embodied in the medical treatises of Avicenna and Rhazes. But Arabian civilization crumbled, and during the Middle Ages additions to scientific knowledge were small; the study of physical science was neglected save in certain mathematical directions, and medicine relied on its classic foundations. Until the seventeenth century, when Harvey announced the discovery of the circulation of the blood, the hippocratic doctrines, sometimes strengthened and sometimes complicated or obscured by additions from Rome and Arabia, remained the bible of the physician and surgeon. There was no case reporting, and so no journalism and no literature. Even Rabelais, the wisest man of his century, lectured on Hippocrates. Indeed, so late as when Harvey's discovery was made there was no interchange of medical thought through literary mediums, and medical journalism cannot be said to have played any part in the diffusion of knowledge immediately needed.

In Harvey's era, however, printing had become a common and well developed art, and the association of journalism with printing is so close that to have talked of journalism when printing was unknown may appear absurd. But actually the essence of journalism is recording, the method of record being accidental. It is a singular fact that although the invention of printing as far as European civilization is concerned occurred in the fifteenth century, the first real medical newspaper, entitled the *Foreign Medical Review*, did not appear until 1780, 150 years after the publication of the De Motu Cordis. Yet Harvey's treatise revolutionized clinical practice and should have been represented in medical literature. But there was no case reporting and so no journalism. The paper ran for some nine years but was not used by the medical profession as a channel of international intelligence, as had been intended, and consequently died.

The loss to medicine implied by the fact that no medical journal existed at the latter half of the eighteenth century was extreme, for it was owing to this fact that John Hunter had no proper opportunity for recording and preserving his wonderful observations. His writings on comparative anatomy existed mainly in manuscript and, as is notorious, they were disgracefully treated by his brother-in-law, Sir Everard Home. One of his amanuenses has reported that he made most careful records of his work, and these first-hand and new scientific observations, exactly the type that the whole medical world would have benefited by reading, would have insured a considerable circulation on their single merits for any medical periodical, a fact that was never perceived either by Hunter or by any of his friends. The work neither of Harvey nor of Hunter was recorded in any form of medical journalism, and this delayed the progress of medicine sadly. In the eighteenth century medical men were still prepared to think as their grandsires—neither medical journalism existed nor was exact knowledge of modern sort apparent in textbooks.

It was not until after Hunter's death that the first efforts of real medical journalism were apparent and the first practical use was made of the art of printing in the cause of medicine. These efforts date from the end of the eighteenth century, and the rest of this little discourse is taken up with the history of various journalistic efforts, among which the foundation of the *Lancet* must be noticed.

Four journals preceded the *Lancet*, as well as the *Foreign Medical Review*, already mentioned, and a medical review started in Boston; but from this point I can speak only of what is known of British journalism, and must leave it to one of your own medical historians —you have them distinguished by their learning—to tell at their pleasure the story as it runs in America. I do not know it, but I know enough of it to know that it is worth telling properly, and that I cannot do.

In Great Britain, then, four journals had a real life at the end of the eighteenth and the beginning of the nineteenth centuries; namely, the *Journal of Natural Philosophy*, the *Medical and Physical Journal*, the *Medico-Chirurgical Review* and the *London Medical Repository*. The first was a fortnightly periodical and was medical only in that a section of its overloaded contents was allotted to medicine in a compendium where all the arts and sciences strove for representation. The *Medical and Physical Journal* was of more medical importance. It was a monthly magazine and ran for twenty-five years, the bulk of its articles being translations from foreign medical journals with critical remarks appended. It was edited by Dr. Roderick Macleod, a learned man, of whom more anon. The *Medico-Chirurgical Review*, started about the same time, was acquired by a retired naval surgeon of real learning, Dr. James Johnston, who altered his property into a quarterly publication, which he appears to have written mostly with his own pen. The *London Medical Repository* started as a monthly medical journal in 1814 but soon lapsed into a quarterly. This publication was edited by Dr. James Copland, F.R.S., the author of the well known medical dictionary, and a man of real wisdom and scientific attainments. In its pages may be seen an advance in medical journalism from many directions and, despite the disadvantage of infrequent issue, this magazine was the first medical journal likely to be useful to the medical profession from a scientific point of view. It often contained valuable contributions on the clinical side; it recorded real happenings, and it commanded the respect of leading members of the medical profession both in its own country and abroad. It died gradually and decently, for it was neither one thing nor another. As a scientific compendium it was imperfect. Thomas Wakley, who founded the *Lancet*, had a far broader conception of what medical journalism should mean.

It is here that I have to apologize for the entirely egoistic character of much that follows. But it happens in actual medical history that the story of the development of medicine, at this epoch, becomes the story of the *Lancet*, for we were earliest to plow a field that was waiting to be tilled.

The *Lancet* was founded by Thomas Wakley in 1823, and the note struck both in its preface and in its first issues was entirely new. Until Wakley's venture took shape, the object of such medical journalism as had materialized was to diffuse medical information—and the object was very imperfectly fulfilled. The *Lancet* proposed not only to do this but also to make itself more especially the organ of the medical profession by indicating in its columns the direction in which reforms were needed to improve the education and training of medical men and to maintain their professional status at a proper standard. It would not be becoming to do more than indicate the policy adopted and the success attained, but it will be observed that such a publication could not possibly be agreeable at first to the whole medical profession. The rank and file would necessarily welcome it both as a medium for their scientific education and as a support in their professional grievances—then more substantial and more bitter than can well be realized today. But the leaders of the medical profession, content with situations which had placed them, and were maintaining them, in their positions, could not be expected to show the same appreciation of the *Lancet*. They might approve of the dissemination of scientific information—although as a matter of fact many of them very much disapproved even of that —but they could not be expected to be pleased at finding the methods of medical training and education, mainly matters resting in their own hands, so ruthlessly criticized. Thus for fifteen years the history of the *Lancet* was one of perpetual quarreling, punctuated with lawsuits in which Wakley appeared now as plaintiff, now as defendant, often winning but always having his damages paid for him if he lost. The most remarkable part of the story at this time is that, despite all the difficulties in which one side of his policy, that of medical reform, involved him, he never lost sight of the other side or regarded it as of secondary importance, but strove throughout to obtain for his pages the best medical information available.

Here, of course, Wakley was in direct rivalry with all the journals whose existence has been mentioned, and all of them were very severe on him for his methods, as far as these consisted in reporting lectures delivered officially, and without the permission of the authors. But the severity of his rivals only stirred Wakley to effective, if scurrilous, rejoinder, and in this way several of the libel actions against the *Lancet* took shape. His point of view was that only by the interchange of scientific knowledge could progress take place, and he hinted (sometimes asserted) that those who put an embargo on his publishing their words were conscious that publicity would proclaim them ignoramuses.

In the *London Medical Repository* Wakley had hoped for support, for the learned Copland had declared himself a medical reformer before Wakley appeared on the scene. But Copland and Wakley soon came to the point of personal quarreling, and this was the reason: Anthony Todd Thompson's famous lectures on materia medica still form the substratum of the British pharmacopeia, and their author had previously written for the *Repository*, but now began to publish his work in the *Lancet*. Copland was vexed and showed it, and Wakley at once called the *London Medical Repository* the Mausoleum and ridiculed week by week the dulness of its erudition and the staleness of its contents. Copland was a physician, a man of science and not a journalist; he had blundered into a quarrel which he did not seek, and when his paper died, as it did shortly, he betook himself to the more congenial labor of writing his well known dictionary, a work of the greatest value to the medicine of the day. As a tribute to medical journalism it should be noted that the foundations of the indispensable dictionary and the official British pharmacopeia were laid in two medical journals.

The old journalism having proved itself futile in dealing with Wakley, or rather with him and a group of formidable supporters recruited from his ancient enemies, a journal was started, under the egis of hospital officials—the class among professional leaders especially attacked by the *Lancet*—the idea being to secure medical readers while sustaining ancient authority.

The *Medical Gazette* made its first appearance in 1827; Roderick Macleod left the *Medical and Physical*

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Journal to edit it, and the following passage throws down the gage of battle in the first preface:

> A few years ago [it runs] a set of literary plunderers broke in on the peace and quiet of our profession. Lecturers who had spent their lives in collecting knowledge, arranging it for communication, and acquiring the difficult art of oral instruction, saw the produce of their lives suddenly snatched from them and published for the profit of others, with the additional mortification of finding what they had taken so much pains with disfigured by bad English and ridiculous and mischievous blunders.

The challenge was gleefully accepted by Wakley. The outward resemblance of the new newspaper to the *Lancet* was great, while all the features likely to make any claim on attention had been borrowed. "Despicable imitations of us have arisen," wrote Wakley, "and stunk and become extinguished. . . . One or two are still emitting a little foetor." For three years a steady fight was maintained between the papers in the terms indicated by this interchange of courtesies, and then Wakley ceased to quarrel, for he perceived that the professional leaders were gradually coming over to his side and writing regularly in his journal, so that the battle was won. The *Medical Gazette* failed but amalgamated with the *Medical Times* and every attempt, under the inevitable change of title, was made to keep the battle alive, but until the *Medical Times* became personally libelous no further rejoinders were made, for the following reason, which Wakley published:

> We have sometimes been asked [he said] why we omit to notice the libels against the private character of the editor of this work which we were informed often appeared in the leading articles of the *Medical Times*. Our answer has always been that we did not believe that such a trashy production was read by members of the profession; and secondly the motives of the slanderer were so palpably obvious and his stupidity so thoroughly apparent that if the rogue was allowed rope enough he was sure to cheat the executioner.

Wakley's silence must have been justified, for at this very time he entered parliament for a large London constituency. Then and after the election, at the instance of the electors of Finsbury, he instituted proceedings for libel, and smashed his enemies.

At this point I ask you to consider the proposition conveyed in the text—namely, that medical journalism is associated with scientific progress—from a different angle. The diffusion of knowledge remaining the great object aimed at, the argument employed was that such knowledge, to be accurate and fruitful, could emanate only from medical men, and that medical men could supply it only if a proper professional life could be secured for them. The state, which would benefit from the treatment of the sick (which medical men and they alone could supply), and from health teaching (which medical men and they alone could inculcate), must afford proper facilities for their education and standardization.

Wakley and his advisers perceived that the sort of evils they were confronted with—the absence of any test by which the public could discriminate between the qualified and the unqualified, the absence of any government control by which medical qualifications, degrees or diplomas could be brought to standardize medical education, and the disorderly management of public institutions, such as hospitals and infirmaries, could be remembered only by the state, and it was with the intention of securing a medical act to insure the indicated reforms that Wakley entered parliament. The law of our land has remedied the abuse, and it was medical journalism which brought these things to pass.

By the middle of the century the cause of medical reform received the powerful advocacy of the *Provincial Medical Journal*, soon to secure a great influence and circulation as the *British Medical Journal*. The two papers, the *Lancet* and the *Journal*, were found now not only publishing the communications which formed the basis on which a great scientific literature was founded but assisting the government in framing medical legislation and reforming public abuses in connection with sanitary administration. Our British medical act of 1858—not precisely Wakley's bill but founded in all respects on it—was the outcome of medical journalism and in its essentials it stands the test of time.

The maintenance of professional status and the standardizing of medical education must accompany the progress of scientific medicine, and it is the business of medical journalism to see that this occurs. It is further the business of medical journalism to spread the lessons derived from sound clinical work, its performance, and the logical deductions therefrom. I will not weary you with the obvious by pointing out that today, in your country and mine, as in the leading civilized states of the world, medical journalism is the medium by which the development both of the theory and of the practice of our art and science find their first expression. Tried out at medical centers and in medical institutions and societies, this knowledge is first reported in serial literature, after which it is crystallized in textbooks, general and special, to become, as it holds the field unchallenged, the accepted view. Thank God, it is being challenged—again in medical journals—for thus is progress maintained.

I am not, I hope, claiming too much for medical journalism. I am asking you to conceive of it as a literary handmaid to medicine, serving you by bringing to the table properly selected meals for you to consume and digest. But you supply the meals, and without your contributions, whether in records, research or philosophy, there would be no meals worth consumption. For editorial and arm-chair science, unsupported by actual experience, is worth nothing: do we not see that in the mushy lucubrations on, say, psychopathy or endocrinology which emanate from writers relying on inner consciousness for their theories, the facts of Hippocrates are obscured by the suppositions of Galen—to draw a fair parallel?

May I, in a closing sentence, pull together the threads of rambling discourse to which you have listened with great patience. I submit the following conclusions:

1. From prehistoric times medicine has made progress when clinical records were used as the source of knowledge, and medical journalism implies the furnishing of such records.

2. When clinical records ceased, medical progress ceased.

3. When the results of research, during the Renaissance, were promulgated, medicine again progressed.

4. The art of printing, as expressed in medical journalism, did not at first play the part which might have been anticipated—Harvey's work took more years than Lister's took weeks to reach the minds of colleagues.

5. During the last hundred years the progress of medicine has been regularly advanced by the development of medical literature, in which situation medical journalism has played its proper part as handmaid.

The Chemical Laboratory

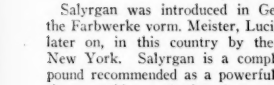
THE FOLLOWING IS A REPORT OF THE CHEMICAL LABORATORY OF THE AMERICAN MEDICAL ASSOCIATION. P. N. LEECH, Director.

CHEMICAL EXAMINATION OF SALYRGAN

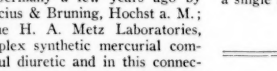
GEORGE W. COLLINS, SC.D.
CHICAGO

Salyrgan was introduced in Germany a few years ago by the Farbwerke vorm. Meister, Lucius & Bruning, Hochst a. M.; later on, in this country by the H. A. Metz Laboratories, New York. Salyrgan is a complex synthetic mercurial compound recommended as a powerful diuretic and in this connection resembles merbaphen (novasurol) somewhat. Recently the product was submitted to the Council on Pharmacy and Chemistry for inclusion in N. N. R., and in this connection the A. M. A. Chemical Laboratory was asked to investigate its chemical composition.

According to the manufacturer, the product is stated to be the sodium salt of mercury-salicylallylamido-*o*-acetic acid. In the submission, H. A. Metz Laboratories proposed the following as a structural formula for Salyrgan (see formula 1).



Formula 1



Formula 2.

On the other hand, in various journals, periodicals and textbooks formula 2[1] is given. In calculating the mercury for these respective compounds, it was found that in neither instance did they agree closely with the limits which were submitted by the manufacturer. The amount of mercury in this compound has been given variously as 36.5, 36.62, 37.6 and 38.3 per cent. Furthermore, some of the proposed formulas include a molecule of water of crystallization. In addition to elaboration and confirmation of tests for purity and identity, the Laboratory was confronted with the following problems:

1. Is the product a definite compound or a mixture?

2. Does the mercury linking consist of acetoxymercuri or hydroxymercuri radical?

3. Is there present a methoxy group as claimed?

The product, as submitted, was a fine, white, odorless crystalline powder, possessing a bitter taste; readily soluble in ethyl alcohol (about 1 in 3), in methyl alcohol (about 1 in 2), in water (about 1 in 1) and insoluble in ether. According to Hager,[2] the product is prepared by the action of mercury acetate and methyl alcohol on salicylallylamido-*o*-acetic acid and subsequent conversion to the sodium salt.

SOME CHEMICAL REACTIONS

On hydrolyzing the product in a reflux apparatus with hydrochloric acid and subsequent distillation, the presence of methyl alcohol was detected in the distillate. This indicated the presence of methoxy group and also the probability of its being in the position indicated in formula 1. Another experiment was to hydrolyze the product with formic acid in accordance with the method described by Wobbe.[3] Metallic mercury was precipitated, and after the fine globules of mercury had been filtered off from the hot solution, crystals were obtained on cooling the filtrate. These were found to have a melting point of 120.5 C., which, according to the manufacturer, is the melting point of salicylallylamido-*o*-acetic acid.

Applying the theory advanced by Schoeller, Schrauth and Struensee,[4] it is quite probable that the mercuric acetate radical would go into the parent substance salicylallylamido-*o*-acetic acid in the presence of methyl alcohol. On the other hand, it is well known that the acetate linking to mercury is exceedingly susceptible to hydrolysis, particularly in alkaline solutions. It did not seem plausible therefore that the sodium salt (which in itself yields alkaline action to the solution) would contain the acetate group as indicated in formula 2. Quantitative determinations, which will be reported farther on in the paper, confirm this belief. In order to aid in the determination as to whether or not the product is a single substance or a mixture, a sample of the product was sent to Dr. Arthur J. Walcott, professor of mineralogy and crystallography at Northwestern University, for crystallographic examination. His report, which is reproduced at the end, indicates that the product is essentially a single substance.

TABLE 1.—*Moisture Determinations*

	Intervals of Drying and Weighing					
	6 Hrs.	24 Hrs.	48 Hrs.	96 Hrs.	216 Hrs.	384 Hrs.
Loss in weight over sulphuric acid	3.55*	4.03		Constant weight		
Loss in weight by drying at 100 C...	5.1	5.68	6.20	7.08	7.91	8.83

* Figures are reported in terms of percentage.

Moisture determinations were carried on over a period of hours and indicated that the product did not contain a molecule of water of crystallization. The results of the determinations are given in table 1. The quantitative determinations are recorded in table 2.

From the analytic data, with certain of the foregoing tests, it is concluded that the formula $C_{18}H_{19}O_5N.Hg(OOCCH_3)Na$, appearing in the German literature, is incorrect. On the other hand, it appears that Salyrgan has the formula of $C_{15}H_{15}O_5N.Hg(OH)Na$.

TABLE 2.—*Results of the Quantitative Determinations*

	Found		Theory	
	Undried Specimen	Calculated to the Dried Specimen	Calculated for $C_{15}H_{15}O_5N.Hg.Na$ OH	Calculated for Formula $C_{18}H_{19}O_7N.Hg.Na$ $OOCCH_3$
Moisture (loss over sulphuric acid.....	4.03*			
Nitrogen (N)	2.78	2.89	2.77	2.56
Sodium (Na)	4.57	4.76	4.54	4.19
Mercury (Hg)	38.1	39.7	39.66	36.62

* Figures are reported in terms of percentage.

Based in part on the manufacturer's submittal and on the results of the work reported herein, standards of identity and purity have been drawn up, which were accepted by the manufacturer and appear under the announcement of acceptance for New and Nonofficial Remedies, this issue, p. 1995.

CONCLUSIONS

From the results of this work:

1. Salyrgan appears to be Sodium { *o*- [γ-(hydroxymercuric)-β-methoxypropylcarbamyl] phenoxy } acetate, a definite chemical compound; $NaOOC.CH_2.O.C_6H_4.CONH.CH_2.CH(O.CH_3)CH_2.HgOH$.*

2. The presence of the methoxy group and the radical, HgOH, as claimed by the firm, were sustained.

3. The formula more generally reproduced in the German literature containing the acetoxymercuri group appears incorrect.

4. While the product contains moisture, there is no evidence that the water is combined in the form of water of crystallization.

5. The product examined was of good purity.

CRYSTALLOGRAPHIC PROPERTIES OF SALYRGAN

1. *Microscopic Study of the Powder as Submitted.*—The powdered substance as it came from the Chemical Laboratory of the American Medical Association showed a predominance of an isotropic substance having an index of refraction of 1.596 ± 0.001. There is present also

1. Neue Arzneimittel, Schweizerische Apotheker-Zeitung **62**: 7 (Aug. 30) 1924.
2. Hager's Handbuch der Pharmazeutischen Praxis, **2**: 1338, 1927.
3. Wobbe, W.: Archiv. Pharm. **262**: 71, 1924.
4. Schoeller, Walter; Schrauth, Walther; and Struensee, Richard: Ber. d. Deutsch. chem. Gesellsch. **43**: 695, 1910; **44**: 1048, 1432, 1911.

* The exact position of the methoxy group has not been fully established, but probably is in the position indicated.

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a very small amount of doubly refracting substance in a very finely divided state, whose indices were very difficult to determine.

2. *Microscopic Study of Salyrgan Obtained from Water Solutions and from Alcohol Solutions.*—Some of the powder was dissolved in water and the water was allowed to evaporate. The substance obtained in this manner was isotropic and appeared to be amorphous. The index of refraction of this substance was found to be 1.596 ± 0.001. Included in this amorphous appearing substance is an abundance of small lath shaped crystals of very strong double refraction. One index of refraction of the crystalline material is much higher than that of the amorphous material and the other index is decidedly lower.

The crystals are scattered rather uniformly throughout the mass of the amorphous material. Here and there is an aggregate of crystals crowded into a divergent bundle.

By allowing evaporation to proceed at a much slower rate, the number of crystals present is noticeably increased. The material obtained by evaporation of an ethyl alcohol solution shows no crystals.

My interpretation of the results obtained from the evaporation of solutions is that the isotropic substance is amorphous and the crystals included in the amorphous mass are the same compound as the amorphous substance. This is indicated by the fact that a larger number of crystals is obtained when evaporation is allowed to proceed more slowly. The absence of crystals from the material obtained from an alcohol solution may be considered due to the alcohol evaporating more rapidly than the water.

If evaporation could be allowed to proceed slowly enough, the entire amount of salyrgan obtained might be in a crystalline state. It appears that the tendency for salyrgan to crystallize is very weak.

If my interpretation of the results obtained from the solutions is not correct, then, of course, it must be concluded that salyrgan is a mixture of a crystalline substance of very strong double refraction and of an isotropic substance having an index of refraction of 1.596 ± 0.001. The isotropic substance appears to be amorphous.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, Secretary.

SALYRGAN.—Mersalyl.—Sodium {*o*-[hydroxymercuric-methoxy-propylcarbamyl] phenoxy} acetate.—$NaOOC.CH_2.O.C_6H_4.CONH.C_3H_5(O.CH_3)(HgOH)$. Salyrgan is a complex synthetic mercurial, prepared by the action of mercury acetate and methyl alcohol on salicylallylamido-*o*-acetic acid and subsequent conversion to the sodium salt. Salyrgan when dried to constant weight contains 39.6 per cent of mercury in nonionizable form.

Actions and Uses.—Salyrgan has been demonstrated to exert a destructive action on the spirochete of syphilis in rabbits, but is used chiefly as a diuretic. It induces diuresis only provided sufficient renal tissue is still intact and is therefore contraindicated in acute diseases of the kidney as well as in advanced nephritis. It is effective in ascites and edema of cardiac and cardiorenal origin; also in ascites resulting from cirrhosis of the liver. It has been tried in hydrothorax, pericardial effusion, and in the ascites of tuberculosis peritonitis, but without uniform results.

Dosage.—Salyrgan is supplied only in the form of a 10 per cent solution. As diuretic, an initial dose, intramuscularly or intravenously, of 0.5 cc. of the solution to test tolerance, increased to 1 cc. or to a maximum of 2 cc. if required; injections are made at intervals of from three to five days.

Manufactured by H. A. Metz Laboratories, Inc., New York. No U. S. patent. U. S. trademark 188,515.

Ampules Salyrgan Solution, 1 cc.: Each ampule contains 1 cc. of a 10 per cent solution of salyrgan.

Ampules Salyrgan Solution, 2 cc.: Each ampule contains 2 cc. of a 10 per cent solution of salyrgan.

Salyrgan occurs as a white, crystalline, odorless powder with a bitter taste; readily soluble in ethyl alcohol, about 1 in 3, methyl alcohol, about 1 in 2 and water, about 1 in 1, and insoluble in ether. An aqueous solution is alkaline to litmus paper.

Dissolve 0.5 Gm. in 5 cc. of water, add 5 cc. of formic acid (90 per cent), boil the mixture under a reflux condenser for fifteen minutes: the precipitate formed dissolves, leaving a gray residue containing fine globules of metallic mercury. Filter the mixture through paper while hot; allow the filtrate to cool, collect the resultant salicylallylamido-*o*-acetic acid crystals on a filter paper, wash and dry over sulphuric acid in a partially exhausted desiccator: it melts at 120-121 C. Dissolve about 1 Gm. in 10 cc. of water, add 10 cc. of a solution of hydrochloric acid (1 part hydrochloric acid and 1 part water), connect to a condenser, distil off about three fourths the volume: the distillate responds to tests for methyl alcohol. Dissolve 0.5 Gm. in 5 cc. of water, add 0.5 cc. of diluted acetic acid and 0.3 cc. of sodium sulphide solution: no coloration results (*heavy metals—especially mercuric ions*). Dissolve 0.1 Gm. in 5 cc. of water, add 1 cc. of nitric acid, filter through paper and divide the filtrate into two portions; to one portion add 1 cc. of silver nitrate solution: no opalescence results (*chlorides*); to the other portion add 1 cc. of barium nitrate solution: no turbidity results (*sulphates*). Dissolve 0.5 Gm. in 10 cc. of water, add 1 cc. diluted sulphuric acid, filter through paper and divide the filtrate into two portions; to one portion add 0.1 cc. of tenth-normal potassium permanganate solution: no immediate decolorization results (*salicylallylamido acetic acid*); to the remaining portion add 0.1 cc. of diluted ferric chloride solution; no violet color develops (*salicylylamide*). When tested for arsenic according to the U. S. Pharmacopeia X, the product meets the requirements for arsenic (p. 428, Arsenic Test).

Dry about 1 Gm., accurately weighed to constant weight over sulphuric acid in a partially exhausted desiccator: the loss in weight does not exceed 5.0 per cent. Transfer about 0.5 Gm., accurately weighed, to a 500 cc. Kjeldahl flask, and determine the nitrogen content according to the official method described in Official and Tentative Methods of Analysis of the Association of Official Agricultural Chemists, Second Edition, p. 8. The percentage of nitrogen corresponds to not less than 2.55 per cent, nor more than 3.0 per cent when calculated to the dried substance. Weigh accurately about 0.5 Gm. in a tared platinum dish, add 10 cc. of sulphuric acid, gently heat while fumes of sulphur trioxide are evolved, repeat, using two portions of 2 cc. of sulphuric acid, respectively, ignite, cool and weigh as sodium sulphate. The percentage of sodium corresponds to not less than 4.3 per cent, nor more than 4.9 per cent, when calculated to the dried substance. Transfer about 0.5 Gm., accurately weighed, to an Erlenmeyer flask; add 100 cc. of water and agitate until the powder has dissolved; add 15 cc. hydrochloric acid, connect to a reflux condenser and boil for three hours. Add 175 cc. of hot water, and pass in hydrogen sulphide for fifteen minutes. (It is important that the temperature of the solution should be about 70 C. in order to keep in solution slightly soluble organic compounds formed during hydrolysis.) Filter while warm, through a Gooch crucible, wash with distilled water and finally three parts of cold alcohol and then one portion of carbon disulphide. Close the rubber tubing leading from the suction flask to the suction pump with a pinch clamp; add sufficient carbon disulphide to cover the precipitate, cover the crucible with a watch glass and allow to stand one-half hour. Then release the pinch clamp, drain off the solution and wash with several portions of carbon disulphide. Dry in an oven at 100 C., weigh the mercury sulphide and calculate to mercury. The percentage of mercury corresponds to not less than 38.0 per cent, nor more than 41.0 per cent, when calculated to the dried substance.

BROMIPIN 33 PER CENT.—Brominized Sesame Oil, 33 Per Cent-Merck.—A bromine addition product of sesame oil, containing from 31 to 35 per cent of bromine in organic combination.

Actions and Uses.—Bromipin, 33 per cent, acts like the inorganic bromides. The combination is not broken up in the stomach; but a portion of the bromine is split off as soon as the compound enters the intestine; the remaining compound is readily absorbed and, as in the case of other fats, is largely deposited in the tissues where it is slowly split up. It is said to be more lasting in its action than the bromides. Bromipin, 33 per cent, is used as a contrast medium for roentgen diagnosis of the tracheobronchial tree. It is stated to be applicable in cases of mild or medium tuberculosis in which the use of an iodized oil is contraindicated.

Dosage.—For therapeutic use, 1.3 cc. (20 minims) which may be increased in cases of epilepsy to from 3 to 10 cc. (40 to 160 minims); for use as a contrast medium in bronchography, the quantity required varies from about 10 cc. to about 30 cc. for each lung. Before injecting into the bronchial tree the oil should be warmed to 37 to 40 C. to reduce its viscosity.

Manufactured by Merck & Co., Inc., Rahway, N. J., under license of the Federal Trade Commission. U. S. patent 774,224 (Nov. 8, 1904; expired). U. S. trademark 32,002.

Bromipin, 33 per cent, is prepared by action of bromine chloride to produce the required brominization.

Bromipin 33 per cent is a yellow oily liquid, having an oleaginous taste.

To 1 cc. of bromipin 33 per cent add 1 cc. of chloroform and a few drops of phenolphthalein solution: the addition of 0.3 cc. of half-normal sodium hydroxide produces a red color (*limit of acidity*).

Saponify about 1 Gm. of bromipin 33 per cent, accurately weighed, by boiling with 25 cc. of alcohol and 5 Gm. of potassium hydroxide in a porcelain dish. Evaporate to dryness on a water bath and incinerate the residue over a gentle flame. Dissolve in water to make exactly 200 cc. and filter. Acidulate 50 cc. of the filtrate in a separator with diluted sulphuric acid; add 20 cc. of carbon tetrachloride and 5 cc. of freshly prepared chlorine water. Shake thoroughly and allow to separate. Repeat this until further additions of chlorine water do not cause the aqueous layer to become yellow. Draw off the carbon tetrachloride solution. Add 10 cc. of carbon tetrachloride, agitate and draw off the solution, uniting it with the first carbon tetrachloride solution. Repeat the extraction with a further portion of 5 cc. of carbon tetrachloride. Pass the carbon tetrachloride solution through a dry filter into a flask and add potassium iodide solution. Shake thoroughly and titrate the free iodine with tenth-normal sodium thiosulphate: the amount of bromine found is not less than 31 per cent nor more than 35 per cent.

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SATURDAY, DECEMBER 22, 1928

RESPIRATORY DISEASES

Mortality rates vary widely for different disease groups and throw little light on the incidence of illness and incapacity. Morbidity rates are far more significant in the study of the health conditions of a community. Accordingly, any adequate consideration of the most desirable direction of attack against the health menaces to mankind must take into account the actual situations that exist in different communities with respect to the incidence of disease. Also, from the standpoint of supplying acceptable medical service, the presenting complaints of the population must be considered; and these do not always give a correct picture of the actual condition of the prospective patient. The Commission on Medical Education,[1] which began to function in the fall of 1925 with the support of the Association of American Medical Colleges, the American Medical Association, the Rockefeller Foundation and the Carnegie Corporation, has pointed out that the health needs of the general population can be studied from two aspects: first, the actual demands that are made by applicants for medical attention, and, second, the physical and mental conditions of persons without regard to whether the conditions found are receiving attention. Data for the first type of information can be secured in part by sampling the demands on general practitioners in communities small enough to give a clear picture of general practice. This is particularly true of the practice of recent graduates, as that of older practitioners includes a higher proportion of serious illness and major surgery.

The studies of the commission, as well as other investigations of the demands for medical service, substantiate the common opinion that a rather large proportion of practice is confined to a relatively few diseases, either in general or in special practice. In the commission's survey of the daily work of 500 recent graduates in medical practice in communities of 50,000 or less in twenty-four states and two provinces, it appeared that about 75 per cent of the office visits were for minor surgery, upper respiratory infections, general medical disorders and venereal diseases. About 90 per cent of home visits were for infections of the respiratory tract, general medical and contagious diseases, obstetrics and minor surgery. Less than 10 per cent are diseases against which public health efforts are mainly directed. This fact is an index of the growing efficiency of public health efforts and also emphasizes the necessity of treating the patient as well as the disease. Furthermore, according to the commission's report, the common causes of disabling illnesses and absenteeism correspond closely with 80 per cent of the combined office and home visits of the general practitioner.

The experiences just recorded recall the observations of Sydenstricker[2] of the United States Public Health Service in a widely quoted report on the incidence of illness in the general population group of Hagerstown, Md., which was investigated thoroughly as a representative community. There more than half of the morbidity was due to respiratory diseases. Nevertheless, the ratio of respiratory illnesses to deaths from respiratory causes was more than 300 to 1. A somewhat similar situation seems to exist in the United States Army, which in 1927 represented a mean annual strength of 132,901 officers and enlisted men selected from various parts of the national domains and serving in many parts of the world. This is in many respects a representative cross-section of the population. According to the Report of the Surgeon General of the Army,[3] the principal causes of "admission," by which is meant all cases admitted to the sick report for treatment in hospital or in quarters, with respect to diseases were bronchitis, tonsillitis and gonorrhea. Here, again, diseases of the respiratory tract bulk large. The actual annual admission rates per thousand of male military personnel in 1927 were: for bronchitis, 51; tonsillitis, 35; pharyngitis, 17; rhinitis, 16. Bronchitis was dominant alike among officers and enlisted men, white and colored troops, and in the United States and the tropics, with the exception of Porto Rican troops, among whom malarial and other fevers predominated. The leading cause of death, on the other hand, was suicide. The admissions to hospitals and quarters on account of the total respiratory group of diseases, including influenza, pneumonia and more common respiratory maladies, amounted to 23,462. Such considerations should suffice to justify a more vigorous campaign directed to the relief of the disorders involved. The better known febrile infections and contagious diseases, cancer and circulatory defects have had a dominant vogue in the programs

1. Three reports have already been issued, in January, 1927, January, 1928, and October, 1928, by the Director of Study, 215 Whitney Avenue, New Haven, Conn.

2. Sydenstricker, Edgar: The Incidence of Illness in a General Population Group, Pub. Health Rep. **40**: 279 (Feb. 13) 1925.

3. Report of the Surgeon General U. S. Army to the Secretary of War, 1928, Washington, Government Printing Office, 1928.

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of progress in medical research. They deserve it, but they must not be allowed to overshadow the needs of study in the domain of some less fatal yet seriously impairing ailments.

VITAMIN B SYNTHESIS IN THE COW, AND THE QUALITY OF MILK

Ever since the importance of certain vitamins for adequate nutrition became established, the question of their origin has been earnestly considered. The readiness with which evidences of deficiency—the so-called avitaminoses—arise whenever vitamin shortage in the diet intervenes has made it clear that the vitamins are not manufactured de novo in the animal organism. Even in the case of the antirachitic effects of sunshine and other forms of irradiation the potent factor is dependent on extracorporeal contributions to its genesis. The available experimental evidence today indicates that the human organism is dependent on exogenous sources, notably food, for its supply of essential vitamins. There are also indications that storage may be accomplished to some extent.

In the case of the infant the milk furnished from one source or another is the sole natural supply of vitamins. Consequently it has become imperative to learn how the content of vitamins may be maintained or altered through the secretion of milk. There are reasons for believing that the milk can be enriched in its vitamin content through liberal administration of sources of vitamins to the individual producing it. Presumably the seasonal variations observed in the quality of cow's milk are explicable through the differences in the quality of the food available at different times of the year.[1] The effort to "improve" human foods through special processes has been exerted in various directions. One may recall, for example, the attempts to enrich hens' eggs in iron and milk in iodine by appropriate feeding of the producing animals. In the case of human milk the studies of Macy and her collaborators [2] indicate that it is comparatively rich in vitamin A. Further evidence of the potency of breast milk is illustrated in the children's clinics, where xerophthalmia is rarely, if ever, observed in nurslings.

Human milk appears often to be decidedly inferior to cow's milk in its content of those factors included under the designation of vitamin B.[3] A presumptive reason for the superiority of the bovine secretion from the mammary gland has been supplied by the investigations of Bechdel, Honeywell, Dutcher and Knutsen [4] at the Pennsylvania State College. They had noted that a calf will grow normally to maturity and produce normal offspring on a ration that carries an insufficient amount of the vitamin B complex to support growth and well being in rats.[5] Subsequently, it was ascertained that vitamin B in milk is not dependent on the presence of this vitamin in the ration of the cow.[6] Cattle differ from the human species in having a rumen wherein foods are subject to vigorous bacterial changes. According to the new observations, in cows on a ration highly deficient in vitamin B, alcoholic extracts of the fermented rumen contents were proved potent in the vitamin B complex through rat feeding trials. One bacterium of the genus *Flavobacterium* was found about 90 per cent predominant in the rumen microflora. This organism was grown in large quantities on vitamin B-free mediums and fed to rats to the extent of about 12 per cent of dried bacterial cells in a synthetic vitamin B-free ration. This test proved the bacterial cells to be highly potent in the vitamin B complex. The results of this study warrant the conclusion that the vitamin B complex was produced in the rumen of the experimental cow by bacterial fermentation. This outcome offers a satisfactory explanation as to why cattle, unlike any other species of animal yet studied, have the ability to grow to maturity, to produce normal offspring, and to yield milk of normal dietary composition, on a ration that carries an insufficient amount of vitamin B complex to support growth and well being in other species.

FUNDAMENTAL RACIAL CHARACTERISTICS

The constancy of the basal metabolism is one of the most striking of physiologic phenomena. This heat production represents the irreducible minimum of energy change; it is the basal oxidative reaction of the cells of the organism under certain set conditions of muscular rest and absence of digestive activity. The value obtained for the given age and sex is a resultant of many factors, both inherent and environmental, and when expressed in the most acceptable way, as calories per hour for each square meter of body surface, is remarkably uniform. Statistical analysis seems to indicate that external influences, such as climate, food and activity operating through or conditioned by the nervous system and the glands of internal secretion, do have some effect on basal metabolism. It would seem, therefore, that a psychic element affects, in part, the activity of the cells and that, in a sense, there is in the determination of basal metabolism a measurement of personality or temperament. The evidence obtained

1. Influences Affecting Lactation, editorial, J. A. M. A. **84**: 818 (March 14) 1925.

2. Macy, Icie G.; Outhouse, Julia; Long, M. Louisa, and Graham, Alice: Human Milk Studies: I. Technique Employed in Vitamin Studies, J. Biol. Chem. **73**: 153 (May) 1927. Macy, Icie G.; Outhouse, Julia; Graham, Alice, and Long, M. Louisa: Human Milk Studies: II. The Quantitative Estimation of Vitamin A, ibid. **73**: 175 (May) 1927; III. The Quantitative Estimation of Vitamin B, ibid. **73**: 189 (May) 1927. Outhouse, Julia; Macy, Icie G.; Brekke, Viola; and Graham, Alice: Human Milk Studies: IV. A Note on the Vitamin A and B Content of Cow's Milk, ibid. **73**: 203 (May) 1927.

3. Vitamin B and Lactation, editorial, J. A. M. A. **90**: 1480 (May 5) 1928.

4. Bechdel, S. I.; Honeywell, Hannah E.; Dutcher, R. A., and Knutsen, M. H.: Synthesis of Vitamin B in the Rumen of the Cow, J. Biol. Chem. **80**: 231 (Nov.) 1928.

5. Bechdel, S. I.; Eckles, C. H., and Palmer, L. S.: J. Dairy Sc. **9**: 409, 1926.

6. Bechdel, S. I., and Honeywell, H. E.: J. Agric. Research **35**: 283, 1927.

with both normal and definitely pathologic persons tends to bear out this suggestion. One might even extend it from individuals to entire nations, and thus account for the distinctive characteristics of the races of mankind.

Investigations bearing on the foregoing theme have recently been carried out both in this country and in the Orient. At the University of Hongkong, Earle [1] has made a large number of determinations of basal metabolism in Chinese and other orientals in China. In all of these experiments the method of indirect calorimetry was employed. Making allowances for the possible inaccuracy in using the usual methods of calculation and standards for comparison, he concludes that the Chinese exhibit a lower basal metabolism than "Westerners." The deviation from the accepted American standards is small—from 5 to 10 per cent—but is always consistently negative. Moreover, it was observed that the basal metabolism of Chinese living in London was likewise lower than that of Europeans. These studies corroborate and amplify those of MacLeod, Crofts and Benedict,[2] who found that oriental girls living in America under typical modern conditions of activity had a basal metabolism definitely lower than that of American girls. It appears from these data that the factors conditioning this physiologic phenomenon are not such that a temporary change of environment will alter them.

Of similar interest are the blood pressure and pulse rate determinations of orientals. Tung [3] at Peking compared the blood pressure of thirty Chinese in America with that of native Americans and found that the value for the former was lower than that for the latter. Moreover, he found that three fourths of these Chinese showed a decrease in systolic pressure and two thirds a decrease in diastolic pressure on going from America to China. Again, Garven [4] in Mukden observed a lower pulse rate in Chinese than is commonly considered normal for Europeans, the average for sixty Chinese students being 67.5. A still lower value was observed in the oriental students in New York by MacLeod, Crofts and Benedict.[2] These investigations indicate that the mechanism governing the circulation in these races acts in a less intense manner than in "Westerners."

What are the factors conditioning this slowing up in these basic functions of the oriental organism? One is tempted to point to the diet and climate and possibly to the social conditions in the native country. If it is true that these factors do exert an influence here is an instance of a remarkable persistence of environmental effects on physiologic activity, for the group of oriental students examined in New York and those studied in London both showed a lowered basal metabolism in spite of the fact that they were living the active life of the "Western" cities. Just how these external causes produce the effects observed and how far these effects have become racial through influence on the germ plasm is a matter for further investigation. The fact that "Westerners" in China show a decreased blood pressure, pulse rate and basal metabolism indicates either that the oriental environment exerts the stronger influence or, more probably, that the European is a more adaptive organism.

1. Earle, H. G.: Chinese J. Physiol. **1**: 59, 1928.
2. MacLeod, Grace; Crofts, E. E., and Benedict, F. G.: Am. J. Physiol. **73**: 449 (July) 1925.
3. Tung, C. L.: Chinese J. Physiol. **1**: 93, 1928.
4. Garven, H. S. D.: Chinese J. Physiol. **1**: 97, 1928.

Current Comment

SPLEEN AND PARASITE RATES IN MALARIA

Clinicians differ in their evaluation of palpation of the spleen in malaria. In the American tropics, where malaria is responsible for a large part of the total morbidity, the clinical features of the disease are known to be misleading. Consequently, in medical services a blood smear is made as a routine in all patients and is repeated frequently in many of them. Temperature curves, cyclic manifestations and palpability of the spleen are not generally considered reliable and the physician newly arrived in the tropics is taught to think of malaria first, and always; he is instructed to spend much time at his microscope. To learn this lesson is not as easy as it seems. H. C. Clark,[1] throughout long experience in the Caribbean area, has been collecting statistics on the size of the spleen in malaria and in other conditions. Much of his work has been with West Indian negroes. Recently, among Haitian negroes, he has made an extensive survey which is significant of the reliance that may be placed on enlargement of the spleen among these people. He employed a method of palpation that is favorable to detection of enlargement of the spleen, and in his coincidental blood work he used the advantageous method of thick blood films. In 11,000 adults he obtained a parasite rate of 23.5 per cent, whereas the spleen rate in the same persons was only 3.05 per cent. This means that only 110 of the 2,585 adults whose blood films were positive for malarial parasites had also palpable spleens. If palpation alone had been relied on in this survey, the diagnosis would have been missed in 2,475 of 2,585 positive cases. In children, of whom 1,102 were examined, the parasite rate was 41.9 per cent and the spleen rate only 22.78 per cent; that is, only 175 of the children whose blood films were positive for malaria had palpable spleens. If palpation alone had been employed, the diagnosis would have been missed in 287 of 462 positive cases. Clark furnishes other figures from his survey which point to the same conclusion, that "as a quantitative method for selecting adult males in need of treatment" palpation of the spleen is unreliable, and that "its success is limited, even when applied to children." The importance of this survey is not confined to those who are charged

1. Clark, H. C.: Spleen and Parasite Rates as Measures of Malaria in the Caribbean Area, Am. J. Trop. Med. **8**: 423 (Sept.) 1928.

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with the welfare of the population of large plantations in the tropics. Because of overpopulation and low wages around the shores of the Caribbean Sea, large numbers of West Indian negroes are migrating and many are found in the large cities of the United States. When one of these patients appears in a hospital ward it is well to think of malaria first, and, if the case is baffling, to spend much time at the microscope.

DIET AND THE CONTRACTION OF THE GALLBLADDER

Only infrequently have there been demonstrated mechanisms or structures in one species of mammal that have no counterpart in another species of the same group. The starch-splitting ferment of saliva, so potent in man, is lacking in the dog's salivary secretion. Likewise the gallbladder, present in most mammals, is absent in the rat and the pocket gopher. One might infer from these and similar instances that the lacking substance or structure is not indispensable. In the case of the gallbladder, however, the converse is not true: This organ cannot be disregarded in the species provided with it. Clinical statistics serve to emphasize the prevalence of disturbances of the gallbladder. The function of the bile reservoir has been discussed, the genesis of gallstones has been studied, and the debate on the existence of a sphincter at the opening of the common bile duct and the coordination of the parts of the biliary system in emitting the secretion has been renewed. The contraction of the gallbladder itself and the circumstances causing this action have been the subject of many recent investigations. It seems well agreed that certain foods, notably fats, bring about a relatively vigorous emptying of the organ. Particularly efficacious in this regard is egg yolk. Krause and Whitaker [1] have compared representative examples of the three great classes of foodstuffs in their effect on the emptying of the gallbladder. One method employed was to study the body of the experimental animal at the end of the desired period and to observe the state of the gallbladder. In other tests the viscus was filled with iodized oil and observed by means of the roentgen ray. The fatty substances used were olive oil, cod liver oil, oleic acid, egg yolk, coconut oil and palmitic acid; the carbohydrates included dextrose solutions, macaroni and rice, while the proteins were represented by lean meat, peptone, casein, milk and albumin. The foods most effective in causing contraction of the gallbladder were those in the fat group, and the soft fats or oils were more effective than the hard fats. The carbohydrates tried were ineffective and the proteins little, if any, more potent in producing the emptying. The psychic factor in stimulating the contraction of the gallbladder seems to have been adequately controlled in these experiments. The results are of great practical value to the physician whose immediate problem may be to allay the exquisite pain accompanying the contraction of a diseased gallbladder or the hydrostatic pressure in a duct occluded by calculi.

1. Krause, W. F., and Whitaker, L. R.: Am. J. Physiol. **87**: 172, 1928.

THE CHILDREN'S BUREAU

Miss Grace Abbott, chief of the Children's Bureau, has just issued the sixteenth annual report of that bureau, dated September, 1928, and covering the period from July 1, 1927, to June 30, 1928. The report points out that three states, Connecticut, Illinois and Massachusetts, have never accepted the cooperation offered by the federal government under the Sheppard-Towner Act. Like the reports of practically all government bureaus, this one is a series of eulogies of the work that has been accomplished, of urges toward the expenditure of more and more funds, and of data susceptible of various interpretations. It is made apparent that the maternal death rate has decreased in sixteen of the states in the birth registration area, remained practically the same in two, and increased in twelve states and in the District of Columbia. The report states that the largest reduction in death rates occurred in states in which special activities were undertaken in addition to general education on prenatal and confinement care. This portion of the report is then made an argument for a continuation of the federal subsidy. The report reads: "To stop now would be to lose the harvest. There are no deaths more tragic than those of women in childbirth. American men and women will certainly want to leave nothing undone that will make motherhood less hazardous." Under this bureau studies were made of rickets, of child labor, of maternal mortality, of juvenile delinquency and of the work of state child welfare commissions. The bureau distributed almost one and one-half millions of pamphlets and publications during the year covered by the report. In her concluding statement, Miss Abbott urges that the present system has served its purpose in demonstrating the usefulness of federal, state and local cooperation in the promotion of the health of children, and states that the health of mothers and babies is certain to suffer if the federal government withdraws. She asks for an extension of the work of her bureau and for more money to carry out the extensive plans. It will be remembered that leading proponents of the Sheppard-Towner legislation agreed not to ask for a further extension of that act after the period of the extension granted had expired. Apparently it is not the intention of some of the proponents to adhere to the agreement. The purpose of the act was presumably to teach the states to care for their own people and not to demonstrate the usefulness of federal cooperation.

Prophylaxis Against Common Cold.—At the present time, the only prophylaxis against the common cold is the avoidance of contact with infected individuals, avoidance of exposure, and the maintenance of good health and resistance. Gargles, sprays and other local applications are of little value in prevention. Vaccines have been demonstrated by Park, Jordan, Dochez and others to be of no value. These investigators have made carefully controlled studies in large groups of individuals. While it does not seem practically possible to keep adults from exposure to infection with the common cold, it is possible to keep infected individuals away from infants and children. Children must be protected from colds as from all other infectious diseases. Only then shall we be able to reduce the morbidity of the common cold.—Peterman, M. G.: Measles and Common Cold, *Wisconsin M. J.*, December, 1928.

Association News

MEDICAL BROADCAST FOR THE WEEK

The American Medical Association Morning Health Talks and Evening Health Hints from Hygeia

The American Medical Association broadcasts daily at 10 o'clock in the morning, central standard time, over Station WBBM (770 kilocycles, or 389.4 meters).

The program for the week of December 24 to 31 will be as follows:

December 24. "Planning A Christmas Dinner," by Dr. R. G. Leland.
December 25. Christmas; no broadcast.
December 26. "Breakfast Food Facts—Part 1," by Dr. R. G. Leland.
December 27. "Breakfast Food Facts—Part 2," by Dr. R. G. Leland.
December 28. "The Use of Optical Apparatus in the Chemical Examination of Medicinal Products," by Dr. J. B. Peterson.
December 29. "Patent Medicine Testimonials," by Dr. Arthur J. Cramp.
December 31. "Medical News," by Dr. J. F. Hammond.

Evening Health Hints from Hygeia at 8 o'Clock, Central Standard Time

December 24. Another Warning to Motorists.
December 25. Christmas; no broadcast.
December 26. Freedom from Freckles.
December 27. Icebox Economics.
December 28. Soft Drinks Not Always Pure.
December 29. Seats for Factory and Store Workers.
December 31. Children and the Movies.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARIZONA

Increase in Death Rate.—The U. S. Department of Commerce announces that the death rate for Arizona for 1927 was 1,281 per hundred thousand of population, as compared with 1,252 in 1926. The increase noted is more than accounted for by increases in the rates from measles, automobile accidents, heart disease, cancer, and diarrhea and enteritis under 2 years of age. There were decreases during the year in the rates from influenza, nephritis and tuberculosis. The estimated midyear population of Arizona in 1927 was 459,000 and in 1926, 445,000.

CALIFORNIA

Personal.—Dr. Edgar L. Gilcreest, San Francisco, lectured at the Mayo Foundation, Rochester, Minn., December 7, on "John Hunter."——Dr. Daniel Coll, Susanville, has been appointed health officer of Lassen County to succeed the late Dr. Hiram B. Ehle.

An Unusual Age.—In reply to an inquiry, the registrar of vital statistics of the state department of public health, Sacramento, states that the death certificate of Mrs. Reyes Cota, who died at Mendota, in Fresno County, in November, gives her age at the time of death as 130.

Increase in Death Rate.—The death rate in 1927, according to the U. S. Department of Commerce, was 1,388 per hundred thousand of population, as compared with 1,365 in 1926. The principal increases in rates in 1927 were from heart disease, measles, cancer and automobile accidents. The principal decreases were from influenza and smallpox. The estimated midyear population of California in 1927 was 4,433,000, and in 1926 it was 4,316,000.

Foundation for Study of Cancer.—Mr. and Mrs. George H. Roos, San Francisco, have given the University of California $100,000 in memory of Mrs. Roos' parents, J. J. and Nettie Mack, to be used in the medical school for the study of cancer and surgical diseases of the chest. Only the interest will be used for research. The fund which will be known as the J. J. and Nettie Mack Memorial Foundation, will be governed by a committee of the medical faculty. The Hooper Foundation will cooperate in this work.

Health at San Diego.—Telegraphic reports to the U. S. Department of Commerce from sixty-five cities with a total population of about 30 million, for the week ending December 8, indicate that the highest mortality rate (28) was for San Diego, and that the mortality rate for the group of cities was 13.3. The mortality rate for San Diego for the corresponding period last year was 20.8 and for the group of cities, 11.9. The annual rate for sixty-four cities for the forty-nine weeks of 1928 is 12.8, as against a rate of 12.2 for the corresponding weeks last year.

Medical Lectures for the Public.—Stanford University School of Medicine announces the forty-seventh course of popular medical lectures, which will be given at Lane Hall, Sacramento Street near Webster, San Francisco, on alternate Friday evenings, at 8 o'clock, as follows:

"Relation of the Inorganic Elements to Health and Disease," Carl L. A. Schmidt, Ph.D., University of California, Berkeley, January 4.
"Present Aspects of X-Rays and Light in Treatment of Disease," Dr. W. Edward Chamberlain, January 18.
"History of Spectacles," Dr. Hans Barkan, February 1.
"Facts and Fancies of Rheumatism," Dr. Leonard W. Ely, February 15.
"Historical Development of Anesthesia," Chauncey D. Leake, Ph.D., University of California Medical School, San Francisco, March 1.
"Study of the Cost of Medical Care," Dr. Ray Lyman Wilbur, March 15.

DISTRICT OF COLUMBIA

Druggists Protest Against Dispensing Liquor.—The District of Columbia Retail Druggists' Association voted, December 11, to ask for a change in the law which would take druggists out of the work of dispensing liquor on medicinal prescriptions. The association declared that the dispensing of medicinal liquor should be placed directly in the hands of government prohibition officials. The burden of dispensing medicinal liquor causes the druggists "inconveniences and annoyances."

ILLINOIS

Decrease in Maternal Deaths.—The state department of health reports that maternal hygiene made a gain in Illinois last year, when deaths of mothers resulting from childbirth complications dropped 15 per cent below those of 1926. The number last year was 717. The leading cause of maternal deaths was puerperal septicemia, which caused 234. Albuminuria was the second important cause, accounting for 187 deaths. Twenty-five counties in the state last year escaped without the loss of a single mother from puerperal causes, and their total of births amounted to 6,315. Two cities, Maywood and Forest Park, whose combined population is 30,000, enjoyed the same distinction. The health department considers that the improvement in maternal mortality is due to the popular application of scientific medical knowledge. The lowest mortality figures on record in Illinois among both mothers and infants are those for 1927.

Heart Disease Leads Again.—Heart disease in Illinois last year, the state department of health says, not only led the mortality column again, but took an upward step. Deaths attributed to heart disease in Illinois, exclusive of Chicago, rose from 7,704 to 8,089, bringing the rate up to 192 per hundred thousand of population; 35 per cent of these 8,089 deaths were among persons under 60 years of age. The fact that 595 of them were in persons under 40 years of age leads to the conclusion that a considerable number of these deaths are preventable. The second highest cause of death in downstate Illinois was nephritis, which accounted for 4,769. About 23 per cent of the deaths from chronic nephritis occurred among persons less than 60 years of age. The third chief cause of death last year was cancer, with 4,346 deaths, and a little more than half of these were in persons less than 60 years of age. Suicide last year was led by only twelve other causes. In Illinois, outside of Chicago, 621 persons killed themselves, an increase of fifty-five over 1926. Homicide declined slightly, the number falling from 327 to 308. Deaths due to automobile accidents increased, and those from railroad accidents declined.

Chicago

Society News.—The Physicians' Fellowship Club, 2451 Kedzie Boulevard, was addressed, December 7, by Dr. Norman Zolla on "Pseudo-Charity, Part and Full Pay Clinics and the Impoverishment of American Physicians."——Among others, Dr. Harvey A. Berkey will address the Chicago Urological Society, December 27, 185 North Wabash Avenue, on "Priapism."——The Chicago Society of Internal Medicine was addressed, December 17, at the City Club by Dr. William J. Gallagher on "Effect of Acid Injection and Trauma on Jejunal Transplants to the Stomach"; Dr. Alfred Koehler, "Hormones of the Suprarenal Gland," and Dr. Harry Singer, "Recovery from Free Perforation of Peptic Ulcer Without Operation."——The Chicago Pediatric Society was addressed, Decem-

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ber 18, at 185 North Wabash Avenue, by Dr. Charles A. Aldrich, Winnetka, Ill., on discussion of the thymus question, with case reports.——The corporation and the board of directors of the Fenger Memorial Association will hold their annual meeting at the Drake Hotel, 11:15 a. m., January 2.——Dr. Charles W. Edmunds, professor of materia medica and therapeutics, University of Michigan Medical School, Ann Arbor, addressed the Chicago branch of the American Pharmaceutical Association, December 11, on "Strophanthus and Strophanthins."——The middle section of the American Laryngological, Rhinological and Otological Society will meet jointly, January 9, 9 a. m., with the Chicago Laryngological and Otological Society at the Palmer House. Physicians are cordially invited. The program includes ten papers for the day with speakers from several cities. No essay will occupy more than fifteen minutes. Visiting members will be guests of the local society at luncheon and dinner. Others may obtain tickets at the desk. Dinner will be informal. The evening speakers will be Dr. Arthur M. Corwin, Gordon J. Laing, Ph.D., dean, Graduate School of Arts and Literature, University of Chicago, and Dr. Morris Fishbein, editor of THE JOURNAL. Clinics will be held at various hospitals the following day.——The Institute of Medicine and the Society of Medical History of Chicago will meet jointly, January 25; Dr. Edmund Andrews will read a paper on "The Origins of Greek Medicine," illustrated; Dr. Benjamin Barker Beeson, "Corvisart: His Life and Work," and Dr. William Snow Miller, University of Wisconsin, "John D. Godman: Anatomist, Naturalist and Medical Editor."——The Chicago Council of Medical Women will be addressed, January 4, at the Medical and Dental Arts Club by Dr. Alice K. Hall on "Ophthalmoscopy in General Disease," and by Dr. Agnes Beulah Cushman on "The Eye in the Diagnosis of Brain Disease."——Dr. Robert T. Frank, New York, addressed the Chicago Gynecological Society, December 13, on "Three Phases of Gynecologic Plastic Surgery," and Dr. Robert M. Grier on "An Analysis of Fifty Cases of Consecutive Ectopic Pregnancies."

KENTUCKY

Society News.—The Christian County Medical Society, Hopkinsville, was addressed in November by Dr. John B. Youmans, Nashville, Tenn., on "The Treatment of Peptic Ulcers," and by Dr. Isaac A. Bigger, Jr., Nashville, on "Surgical Treatment of Pulmonary Tuberculosis."——Dr. William H. Hobbs addressed the Perry County Medical Society, Blue Diamond, November 12, on "Compensation Testimony," and Mr. William Stanfield on "Medical Jurisprudence."

Dr. Moore Succeeds Dr. Graves as Dean.—The board of trustees of the University of Louisville announces that Dr. John Walker Moore has taken up the duties of dean of the school of medicine, succeeding Dr. Stuart Graves, who resigned to accept a similar position at the University of Alabama School of Medicine, Tuscaloosa. Dr. Moore has been a teacher in the school for a number of years, and he will retain that work as well as that of staff executive of the city hospital. He is a native of South Carolina and graduated from the University of Pennsylvania School of Medicine in 1912.

Personal.—Dr. James W. Scudder has taken over the duties as health officer of McLean County with headquarters at Calhoun, succeeding Dr. James S. Fitzhugh, who resigned to engage in practice at Central City.——Dr. William F. Peebles, Clinton, has been elected president of the Walnut Log Medical Society for the ensuing year.——Dr. John L. Jones, formerly of New Haven, Conn., has been appointed state epidemiologist. He is a graduate of Harvard University Medical School and of the Harvard School of Public Health.——The Baptist General Hospital, Ashland, will be known hereafter as the Stephenson Hospital and Clinic, having been purchased by Dr. John W. Stephenson.

LOUISIANA

Society News.—Dr. Erasmus D. Fenner was elected president of the Orleans Parish Medical Society, New Orleans, for 1929, and Dr. Henry Theodore Simon, reelected secretary. The guest of honor at the annual banquet was Dr. William C. Rucker of the U. S. Marine Hospital, New Orleans. The society conducted its second annual "longer life week," December 3-8.——Dr. Carroll W. Allen, New Orleans, addressed the St. Tammany Parish Medical Society, November 14, Slidell, on the diseased gallbladder.——Dr. Henry Daspit, dean and professor of psychiatry, Tulane University of Louisiana Graduate School of Medicine, New Orleans, addressed the Sixth District Medical Society, Jackson, November 14, on "Psychiatric Aspects of Chronic Epidemic Encephalitis."

MICHIGAN

Hospitalization of Mental Patients.—A committee of the Michigan State Medical Society reported to the house of delegates at the last annual meeting that until 1915 facilities in Michigan for the care of the insane compared favorably with those in other states. Since then the population has increased, but this increase has not been met by a proportionate increase in the facilities for mental patients. In 1927, the committee says, there were 213 beds per hundred thousand of population. There are twenty-eight states that provide a higher percentage of beds for the insane than Michigan. Some of the results of the deficiency of facilities in Michigan which the committee points out are (1) hospitals for the insane are crowded beyond their capacities; several have waiting lists; (2) insane persons are frequently cared for in jails, many are at large in the community and many are cared for in their homes; (3) probate courts are avoiding commitments to hospitals because there is no room for the patients. The committee believes that the state should undertake a comprehensive building program which will meet the needs and provide for the future. There should be, it appears from this study, an addition of about 4,500 beds to the present hospital facilities for the care of the insane, included in which would be a new state hospital of about 2,500 beds and the addition of about 2,000 beds to the existing state hospitals. There is apparently needed a new training school for the feebleminded and an additional 1,200 beds at the Michigan Farm Colony for Epileptics. Members of the committee making this study were Drs. George F. Inch, Traverse City; Leo J. Dretzka, Detroit, and Albert M. Barrett, Ann Arbor.

Society News.—Dr. Millard Smith, Ann Arbor, addressed the Gratiot-Isabella-Clare County Medical Society, November 8, on "Rheumatoid Disease."——Dr. Cyrus C. Sturgis, Ann Arbor, addressed the November meeting of the Shiawassee County Medical Society on heart disease; Dr. Nelson S. Keeler, Ann Arbor, "Acute Affections of the Throat"; Dr. Charles S. Kennedy, Detroit, "Fractures of the Skull and Spine," and Dr. Clyde K. Hasley, Detroit, "Eczema and Other Skin Diseases."——Dr. William J. Cassidy, Detroit, gave a thyroid clinic before the Livingston County Medical Society, Howell, recently, and addressed the members at a dinner on "Surgical Thyroids."——Dr. Oliver P. Kimball, Cleveland, addressed the Muskegon County Medical Society in October on "Prevention of Goiter Among School Children."——Dr. Frank J. Holdsworth, Traverse City, addressed the Grand Traverse-Leelanau County Medical Society in October on the Trudeau Sanatorium at Saranac Lake; the society held a clinical meeting in the afternoon and evening of October 30, and Drs. Noah E. Aronstam, Detroit, and Charles B. Lakoff, Detroit, demonstrated skin disease and surgical conditions, respectively.——The Kent County Medical Society was recently addressed by Dr. Harold C. Robinson, Grand Rapids, on "Management of the Arthritic"; by Dr. Carl F. Snapp on "Problem of the Hard of Hearing," and by Dr. Frederick C. Warnshuis, Grand Rapids, on "Organizational Achievements."——The St. Clair County Medical Society, St. Clair, recently held a symposium on eye, ear, nose, throat and chest conditions in infants and children.——The Marquette-Alger Counties Medical Society was addressed at a dinner meeting, November 3, at Marquette, by Dr. Frank Smithies, Chicago, on "Gastric Hemorrhage, Its Significance and Treatment."——The Wayne County Medical Society, Detroit, was addressed, December 18, on "The Acute Traumatic Abdomen and Its Surgical Significance" by Dr. William J. Cassidy.——The house of delegates of the Michigan State Medical Society directed its legislative commission to prepare two bills for introduction into the coming session of the legislature. These bills are called the "Professional Qualifications Act" and the "Medical Practice Act"; copies have been sent to the county society legislative committees and officers in order that they may urge their representatives to support them. The bills have the approval of the governor.

NEW JERSEY

Society News.—Dr. Joseph Poland, Atlantic City, has been elected president of the Atlantic County Medical Society for the ensuing year. The society was addressed, December 14, by Dr. Clyde W. Collings, chief of the urologic clinic, Bellevue Hospital, New York, on "Electrical Excision of Prostatic Bar."

Hospital News.—The women's auxiliary of the Bayonne Hospital, Bayonne, will hold its annual dance, December 27, the proceeds of which will be used toward the furnishing of the children's ward and the nurses training school. Donations for this purpose may be sent to Mrs. J. J. McBride, 812 Avenue C, Bayonne.——President Coolidge has approved a

recommendation of the Federal Board of Hospitalization for the purchase of a site in Somerset County, N. J., for a $2,000,000 veterans' bureau hospital of 400 beds for nervous and mental cases.

NEW YORK

Personal.—Dr. Arthur T. Davis, executive secretary of the state board of health of Delaware, has been appointed health officer of Suffolk County.——Dr. Arthur W. Elting is reported to have been bequeathed $100,000 in the will of the late George C. Hawley, Albany, whose family physician he was.——The salary of Dr. George W. Goler, for thirty-one years health officer of the city of Rochester, has been increased from $6,000 to $8,000.

The Syracuse "No-Cold" Club.—Syracuse claims to have been the first city to start a No-Cold Club as an active community-wide project, although the idea came through the use of the term in a Chicago Health Department bulletin. The campaign launching the club lasted two weeks, but interest in the prevention of colds is still being talked about by the people of the city and Onondaga County. Industries and business houses have been led to try to reduce the number of colds among their employees. Publicity was afforded through the distribution of humorous posters and 60,000 illustrated pamphlets. The mayor and other prominent persons made public application for membership. The local newspapers cooperated and the radio was used. Some by-laws of the club are that members must avoid persons who spread "cold germs" through coughing or sneezing. They must avoid overfatigue and their room temperatures must be 68 degrees rather than 70. Members in the club comprise three classes; "regular fellows," who steer clear of colds; "members on probation," having one cold a year, and "members in disgrace," having two colds a year.

New York City

Memorial Meeting.—Under the auspices of the Rockefeller Institute for Medical Research, a meeting was held at the New York Academy of Medicine, December 20, in memory of the late Dr. Hideyo Noguchi, who died of yellow fever in Africa, recently, while conducting research work on that disease. The president of the Rockefeller Foundation, George H. Vincent, Ph.D., presided at the meeting, and the speakers were Drs. William H. Welch, Baltimore; Theobald Smith, Princeton, N. J.; Simon Flexner, and a representative of the Japanese embassy.

Another Leper in New York.—Bellevue Hospital had under observation in November a man, aged 55, who had had leprosy for years. The case became known through an accident in which the patient placed his feet in scalding water. Because of the anesthesia of his limbs due to his chronic condition, he did not discover that the water was so hot until his feet had been severely burned. When he was taken to Bellevue Hospital the pathologist recognized the underlying cause of the accident. After a short period of observation, the patient will be sent to the U. S. Leper Colony at Carville, La. Bellevue Hospital has had two other lepers in two years, a Porto Rican boy of 8 years and a young negro from Harlem.

Society News.—The medical section of the American Association for the Advancement of Science, the History of Science Society, and the New York Academy of Medicine will hold joint meetings at the academy during the annual session of the American Association for the Advancement of Science. Among others, Lynn Thorndike, Ph.D., Columbia University, will speak on "Relation of Medicine to Magic and Science"; Dr. T. Wingate Todd, Cleveland, on "Medicine and Its Relation to Anthropology and Ethnology"; Dr. Gerald B. Webb, Colorado Springs, Colo., "Rôle of Physicians as Poets and Men of Letters"; Dr. James J. Walsh, New York, "Rôle of Catholic Physicians and Scientists in the Advancement of Civilization"; Frederick E. Brasch of the Library of Congress, "Medical Men in Mathematics, Astronomy and Physics," and Morris R. Cohen, Ph.D., "Relation Between Medicine and Philosophy."——The Medical Society of the County of Kings invited Dr. Shirley W. Wynne, recently appointed health commissioner of New York, to address its December 18 meeting; Dr. Konrad E. Birkhaug, Rochester, spoke on "Antitoxin Treatment of Erysipelas," and Dr. Emanuel Libman on "Some Phases of Rheumatic Fever."

Eleven Hundred Witnesses.—The investigation of ambulance chasing in New York has been completed; 1,110 witnesses were examined at the hearings, and nearly 9,000 pages of testimony were taken. The counsel of the New York State Medical Society, L. P. Stryker, says in the *New York State Journal of Medicine* that a condition was found among some members of the bar which shocked the community. Quoting the judge who made the report, he says that personal injury cases came into the hands of relatively few lawyers, some of whom conducted their practice purely as a business to the detriment of the public and the profession. These lawyers maintained an organized system of solicitation by which they obtained prompt information of accidents from hospital employees, ambulance drivers, taxicab drivers and others, and they paid them for such information. There is one clause in the judge's report, Mr. Stryker says, which should interest the medical profession:

> A close connection is frequently found between the physician and the "ambulance chasing" lawyer. In a great many cases the physician recommended the lawyer, and occasionally the lawyer suggested the physician. In some instances the testimony or certificate of the physician was used to bolster up claims for injuries which were never sustained, or were grossly exaggerated. Existing laws are ample to reach the dishonest physician. Aside from the provisions of the penal law, the recently enacted addition to the education law, entitled article 48, gives the state education department control over the practice of medicine. By the terms of this article, the license of an offending physician to practice medicine may be revoked or other punishment imposed by the department, upon the presentation of charges by the grievance committee, created by that act. Justices should promptly bring to the attention of this grievance committee, or the public prosecutors, any improper conduct on the part of physicians.

Mr. Stryker is of the opinion that the practice revealed will affect relatively few physicians, but that it will add to the prestige of the profession and assist in reenforcing public confidence if the grievance committee fearlessly performs its duty.

SOUTH CAROLINA

Red Cross Distributes Quinine.—The national headquarters of the American Red Cross distributed 90,000 five-grain capsules of quinine, 400 ounces in bulk and 15 gallons in liquid form, during September and October to combat an outbreak of malaria in southeastern South Carolina, including Clarendon, Georgetown, Orangeburg, Florence, Williamsburg and Berkeley county chapters. Pools of water in the lowlands permitted malaria to increase. Physicians reported, it is said, that many people were too poor to buy quinine and they agreed that a supply in the hands of the Red Cross would help them in stopping the outbreak.

Society News.—Dr. Stuart McGuire, Richmond, Va., addressed the Chesterfield County Medical Society, Cheraw, November 22, on "Positive and Differential Diagnosis of Exophthalmic Goiter"; Dr. Charles W. Kollock, Charleston, on "The Head Cold"; Dr. James H. Gibbes, Columbia, "Significance of Heart Murmurs," and Dr. James Buren Sidbury, Wilmington, N. C., "Toxemias of Infancy and Childhood."——Dr. Daniel L. Maguire, Charleston, addressed the Florence County Medical Society, recently, on "Surgical Mortality," and Dr. Olin B. Chamberlain, Charleston, on neurologic conditions met by all men in practice.

TENNESSEE

Operation in Jail.—When the sheriff of Roane County considered it unwise to permit the removal of a prisoner to a hospital for an emergency operation for a strangulated hernia, physicians went to the jail and operated on the prisoner. A week later, the operation was reported as successful and the patient as "getting along fine." He was a negro convicted of murder.

Health at Knoxville.—Telegraphic reports to the U. S. Department of Commerce from sixty-five cities with a total population of about 30 million, for the week ending December 8, indicate that the lowest (5.5) mortality rate was for Knoxville. The mortality rate for Knoxville for the corresponding week last year was 17.9, and for the group of cities, 11.9. The highest infant mortality rate (130), for the week ending December 8, in these sixty-five cities, was for Memphis.

Society News.—Dr. James L. L. Bibb, Chattanooga, has been elected president of the East Tennessee Medical Association for the ensuing year.——The Middle Tennessee Medical Association held its sixty-eighth semiannual meeting at Columbia, November 22-23, under the presidency of Dr. Sam P. Bailey, Nashville, whose address was on "Certain Functional Disorders of the Colon." Among others, Dr. Harrison H. Shoulders, Nashville, read a paper on "Cholecystitis Without Stones;" Dr. Oval N. Bryan, Nashville, "Coronary Thrombosis"; Dr. William C. Officer, Monterey, "Value of Rest and Exercise in Treatment of Tuberculosis"; Dr. John T. Moore, Algood, "Acute Colitis in Children"; Dr. Morris B. Garner, Edenwold, "Is the Average Anesthetist Competent?" and Drs. William D. Haggard, and Carl R. Crutchfield, Nashville, "Cancer of the Rectum," illustrated with lantern slides.——The

Knox County Medical Society recently approved the administration of typhoid and smallpox vaccine and of toxin-antitoxin by the newly organized county health unit. Dr. Andrew F. Richards, Knoxville, past president of the state association, and director of the Knox County health unit, discussed before the society the part immunization plays in a health program. ——Dr. Max Goltman has presented to the Memphis and Shelby County Medical Society the Memoirs of Sir William Osler, which will be placed in the library of the University of Tennessee where are other books owned by the society. Among others, Dr. Percy H. Wood addressed the society, recently, on "Conservative Pelvic Surgery."——The Memphis Obstetrical and Gynecological Society, Memphis, was addressed, November 7, by Dr. Jesse J. Cullings on "Fallacies of the Sturmdorf Operation."——Dr. C. H. Johnson has been appointed assistant superintendent of the Central State Hospital, Nashville.—— Dr. James K. P. Blackburn has resigned his position as alderman of Pulaski to devote more time to the practice of medicine.

WEST VIRGINIA

Society News.—Dr. Ritchie A. Ireland, formerly of the Mountain State Hospital, has been elected president of the Hospital Association of West Virginia for the ensuing year. ——The Fayette County Medical Society, Mount Hope, December 11, disapproved the establishment of free venereal clinics by the county health unit and advocated the treatment of these patients by family physicians. Dr. Milton C. Borman, Montgomery, has been elected president of the society for the ensuing year. A series of heart conferences held at the Coal Valley Hospital was illustrated by patients and pathologic specimens. The November 28 conference was on diseases of the heart muscle; the December 5, on diseases of the heart valve, and the December 14, on clinical disorders of the heart beat. Dr. Clint W. Stallard addressed the society recently on treatment of fractures.

GENERAL

Influenza Board Appointed.—The surgeon general, U. S. Public Health Service, has appointed a board of veteran health officers for the purpose of assisting in meeting the outbreak of influenza which recently threatened to become epidemic throughout the country. The board consists of Drs. George W. McCoy, Wade H. Frost and James P. Leake, who are expected to submit from time to time recommendations for the control of the epidemic. The total number of cases reported for the week ending December 8 was 40,820, Kansas reporting 13,596; California, 10,296; South Carolina, 5,145, and Montana, 4,580. The interest of Congress in the danger of an influenza epidemic is shown by the fact that a bill was introduced, December 13, appropriating a large sum to combat the epidemic. This bill is noted in another general news item entitled "Medical Bills in Congress."

Fourth Pacific Science Congress.—Under the auspices of the Netherlands Indies Science Council and supported by the Netherlands Indies Government, the Fourth Pacific Science Congress will be held at Batavia-Bandoeng, May 16-25, 1929. The general president is Dr. O. De Vries, director, Rubber Experiment Station, Buitenzorg. The delegate of the American Medical Association to this congress is Dr. William L. Moss, Boston. Members of the congress will include official delegates representing constituent countries of the Pacific Science Association, official representatives of other Dutch and foreign scientific institutions and those who have received a personal invitation. Only members are eligible to attend all the festivities, but other persons interested may participate in the meetings on payment of fifteen guilders. The program will be divided into the divisions of physical sciences, biologic sciences, and the agricultural sciences. Excursions of scientific interest and others of general and historic interest, as well as receptions and dinners, will take place. All papers on subjects connected with the aims of the congress will be published in the proceedings.

Society News.—Dr. Percy G. Cornish, Jr., Albuquerque, N. M., has been elected president of the Medical and Surgical Association of the Southwest for the ensuing year.—— The American Society for the Control of Cancer has purchased a moving picture, known as the "Canti Cancer Film," which was made in England by Dr. Ronald G. Canti, at St. Bartholomew's Hospital, London. It was shown, December 5, by George A. Soper, Ph.D., before the Radiological Society of North America at Chicago.——Dr. Philemon E. Truesdale, Fall River, Mass., has been elected president of the New England Surgical Society for the ensuing year, and Dr. John M. Birnie, Springfield, Mass., secretary.——The American Urological Association will meet next year at Seattle, July 1-3; the western branch of the association will hold a session at Vancouver, July 5.——The Pacific Coast Oto-Ophthalmological Society will hold its next annual meeting in Salt Lake City, Utah, July 1-3, 1929.——The Inter-State Post Graduate Medical Association of North America will open its spring assemblies at Rochester, Minn., April 15, and will end them at Washington, D. C., May 8, in the meantime visiting Chicago, Cleveland, Boston, New Haven, New York, Philadelphia and Baltimore. The European assemblies will be from May 18 to July 11, opening in London, May 27, and continuing at Glasgow, Edinburgh, Oslo, Stockholm, Upsala, Hamburg, Berlin, Frankfort and Paris. Information may be obtained from Dr. William B. Peck, managing director, Freeport, Ill.——The National Tuberculosis Association has arranged four institutes for the training of tuberculosis workers for 1929; they will be held in New York, January 14-26, on "Methods of Health Publicity"; in Philadelphia, the first week of March; in Columbus, Ohio, the first week of April, and in Minneapolis, the last two weeks of June. Students desiring to enrol may secure information from the association, 370 Seventh Avenue, New York.——Dr. Lucius E. Burch, Nashville, Tenn., was elected president of the Southern Surgical Association at the annual meeting at White Sulphur Springs, W. Va., December 13, and Drs. Albert O. Singleton, Galveston, Texas, and Fred W. Bailey, St. Louis, vice presidents. The next annual meeting will be at Savannah, Ga.

Association for Advancement of Science.—The eighty-fifth meeting of the American Association for the Advancement of Science and associated societies will be held in New York, December 27-January 2, under the presidency of Henry Fairfield Osborn. The association is to be the guest of the American Museum of Natural History of which Dr. Osborn is president, Columbia University and the Metropolitan Museum of Art. There are about sixteen sections in this association, section N being devoted to medical sciences. This section will hold sessions Friday and Saturday afternoons jointly with the New York Academy of Medicine and the History of Science Society. The general topic will be "History and the Various Sciences as Related to Medicine." The section is planning a joint meeting also with the section on chemistry, the topic to be the chemistry of plant and animal derivatives, with special reference to medicine. The Canti motion picture film will be exhibited by Charles A. Kofoid, Sc.D., University of California, Berkeley, before section N. Other societies related to medicine which will meet at this time include the American Society of Parasitologists, the American Society of Zoologists and the Entomological Society of America, all of which meet in Teachers College, Columbia University. Other societies meeting are the American Society of Plant Physiologists, the American Psychological Association, the American Microscopical Society, the American Anthropological Association, the American Phytopathological Society, and the American Association of University Professors. Several general sessions will be held, one being addressed by Prof. Arthur H. Compton, Ph.D., of the University of Chicago on "What Is Light," another by William M. Wheeler, Ph.D., Harvard University, Cambridge, on "New Tendencies in Biologic Theory." Dr. Kofoid will also exhibit the Canti film at one of the late afternoon sessions. This film depicts the behavior of tissue cells in vitro and the effect of radium on malignant cells. Sunday, December 30, comes within the period of meeting and a special complimentary concert for that afternoon by the New York Philharmonic Symphony Orchestra has been arranged. The general secretary of the association is W. J. Humphreys, U. S. Weather Bureau, Washington, D. C., and the chairman of the executive committee of the council, J. McKeen Cattell, editor of *Science*, Garrison-on-Hudson, N. Y.

Medical Bills in Congress.——H. R. 15339, introduced by Representative Edwards of Georgia, authorizes an appropriation of $25,000,000 to be expended by the Surgeon General of the United States Public Health Service in an effort to combat and prevent influenza in the United States. H. R. 7031, authorizing the Secretary of the Interior to arrange with the states for the education, medical attention and relief of distress of Indians, has been reported, with amendment, by the House Committee on Indian Affairs. H. R. 14153, authorizing an additional appropriation of $150,000 for the construction of a hospital annex at the Marion Branch of the National Home for Disabled Volunteer Soldiers, has been favorably reported to the House. H. R. 14810, introduced by Representative Howard of Oklahoma, authorizes the Secretary of the Interior to contract with the state of Oklahoma for the education, medical attention, care of the insane, and relief of distress of restricted Indians and their children in that state. H. R. 14932, introduced by Representative White of Colorado, provides that the term "man" and "enlisted man" as used in the World War Veterans'

Act shall be construed to mean, in addition to the meaning such terms now have, cadets in the United States Military Academy and midshipmen at the United States Naval Academy. H. R. 15010, introduced by Representative McSwain of South Carolina, provides for the retirement of disabled nurses of the army and navy. H. R. 15073, introduced by Representative Anthony of Kansas, authorizes the appropriation of $680,000 for the construction of buildings, including a hospital wing and physicians quarters, at the Western Branch of the National Home for Disabled Volunteer Soldiers. H. R. 15074, introduced by Representative Bland of Virginia, authorizes the appropriation of $630,000 for the construction of additional hospital facilities and physicians' quarters at the Southern Branch of the National Home for Disabled Volunteer Soldiers, at Hampton, Va. H. R. 15212, introduced by Representative Kindred of New York, provides for the establishing of a national institute of health, and for increased appropriations for the Hygienic Laboratory, and authorizes the government to accept donations for use in ascertaining the cause, prevention and cure of disease affecting human beings. H. R. 15215, introduced by Representative Houston of Hawaii, extends for a period of two years the provisions of the Sheppard-Towner Act, so far as they apply to the territory of Hawaii. H. R. 15272, introduced by Representative Fish of New York, provides for the deportation of aliens convicted of violating the Harrison Narcotic Law. H. R. 15273, introduced by Representative Fish of New York, authorizes the Commissioner of Prohibition to establish a foreign intelligence unit to obtain information abroad which will lead to the apprehension of smuggled drugs, smugglers and other violators of the Harrison Narcotic Law. H. R. 15274, introduced by Representative Black of New York, amends the National Prohibition Act by removing the restrictions now placed on physicians with respect to prescribing medicinal liquor. H. R. 15327, introduced by Representative Holaday of Illinois, authorizes an appropriation of $300,000 for the erection of a hospital and physicians' quarters at the National Home for Disabled Volunteer Soldiers at Danville, Ill. H. R. 15336, introduced by Representative Jeffers of Alabama, authorizes an appropriation of $1,500,000 for the erection of a United States Veterans' Hospital in the state of Alabama. H. R. 15205, introduced by Representative Britten, Illinois, authorizes the President to appoint acting assistant surgeons in the Navy, providing the number so appointed plus the number of commissioned officers of the medical corps shall not exceed the total number of commissioned officers of the medical corps authorized by law. Under existing law, the President may appoint twenty-five acting assistant surgeons in the Navy.

Bequests and Donations.—The following bequests and donations have been announced recently:

St. Francis Hospital, Peoria, Ill., will eventually receive the entire estate of the late Thomas W. Webb, which totals about $1,500,000.

Theda Clark Memorial Hospital, Neenah, Wis., $50,000 by the will of Dedrick W. Bergstrom.

Methodist Episcopal Hospital, Philadelphia, $26,000 by the will of Mrs. Emma Lentz for the endowment of seven free beds in memory of her husband.

Methodist Hospital, Brooklyn, $500 by the will of the late William H. Van Benschoten.

Southwestern Presbyterian Sanatorium, Albuquerque, N. M., $150,000 to erect a tuberculosis laboratory.

Major Memorial Hospital, Shelbyville, Ind., $30,000 by the will of James H. Hall.

Knox County General Hospital, Rockland, Me., an additional $50,000 by Edward W. Bok, Philadelphia, for the construction of the William Bok Home for Nurses, which will be a memorial to Mr. Bok's brother.

St. John's Riverside Hospital, Yonkers, N. Y., $5,000 by the will of the late Fannie A. Jackson.

Beth Moses Hospital and Jewish Hospital of Brooklyn each $1,000 by the will of the late Isaac Simon.

St. Luke's Hospital, New York, $5,000 by the will of the late Martha Low.

Bryn Mawr (Pa.) Hospital, about $850,000 by the will of the late Herbert Lloyd.

Presbyterian Hospital and St. Luke's Hospital, Chicago, each $100,000; Chicago Lying-In Hospital, Children's Memorial and the United Charities of Chicago, each $50,000; Provident Hospital and Training School, Chicago Home for Convalescent Women and Children, Home for Destitute Crippled Children, Chicago Nursery and Half Orphan Asylum, all of Chicago, Country Home for Convalescent Children, Prince Crossing, Ill., and the William W. Backus Hospital, Norwich, Conn., each $25,000 by the will of the late Mrs. Isabella F. Blackstone.

Tacoma General Hospital, Tacoma, Wash., $50,000 by the will of the late W. R. Rust.

Hillsboro Hospital, Hillsboro, Ohio, $5,000 by Mrs. John C. Spargur in memory of her husband.

Holden Hospital, Carbondale, Ill., $35,000 by the will of Mrs. Carrie Holden, the founder of the hospital.

The city of Boston, $100,000 by the will of A. Shuman to construct a building for male patients convalescing from acute diseases following treatment in the city hospital, except those convalescing from alcoholism. It will be known as the A. Shuman Memorial Building for Convalescent Men. Boston has a similar hospital for women.

Princeton University, Princeton, N. J., $500,000 for new equipment for advanced teaching and research in the physical and biologic sciences. This brings the total gifts to the Scientific Research Foundation to $1,931,028, leaving less than $70,000 to be obtained by the university in order to receive the conditional gift of $1,000,000 from the General Education Board.

Children's Hospital, San Francisco, two gifts of $5,000 each by the will of the late Mrs. Maria Elizabeth Mills to establish free beds in memory of her two sons to be known as the "Ruskin Haswell Mills free beds" and the "Irving Wood Mills free beds."

Hospital of the University of Pennsylvania, Philadelphia, more than $16,000 by the will of the late Alexander Huston of Conshohocken in memory of the late Dr. George M. Stiles and his daughter.

Newport Hospital, Newport, R. I., $15,000; Home for the Aged Poor, Newport, R. I., $5,000; Massachusetts General Hospital, Boston, $10,000; Children's and Infants Hospital, Boston, $5,000 each; Boston Dispensary, $10,000, and the Sharon Sanatorium, $5,000 by the will of the late Miss Ida Means Mason, Boston.

Lake View Hospital, Danville, Ill., $10,000 from the estate of Mrs. Grace K. Maring.

Children's Memorial Hospital and Home for Destitute Crippled Children, Chicago, each $5,000, by the will of the late John H. Jones.

Kensington Hospital for Women, Philadelphia, $10,000, by the will of the late William R. Ellison.

Nursing Sisters of the Sick Poor, New York, $5,000; St. Peter's Hospital, Brooklyn, $3,000; Servants of Relief for Incurable Cancer, Manhattan, $5,000, and St. John's Hospital, Brooklyn, $5,000, by the will of the late Mr. William J. Wharton, Brooklyn.

Home for Incurables, New York, $1,000,000, partly for a cancer building; New York Orthopedic Dispensary and Hospital, $1,000,000; Hospital and House of Rest for Consumptives, $200,000; New York Hospital, $125,000; St. Luke's Hospital, $50,000; Beekman Street Hospital, $10,000, and New York Eye and Ear Infirmary, and New York Institution for Education of the Blind, $25,000 each, by the will of the late Mrs. Ann E. Kane, whose public bequests amounted to more than $7,700,000.

Albany Hospital, Albany, will receive the residue of the estate of the late George C. Hawley, estimated at $3,000,000. Mr. Hawley in his will made specific bequests amounting to $868,000, among which were $50,000 to the Albany Association of the Blind, and $25,000 each to the Home for Aged Men and the Albany Orphan Asylum.

New York Society for the Relief of the Ruptured and Crippled, New York, ultimately the residue of the more than $50,000 estate of the late Miss Beatrice B. How.

Brooklyn Hospital and St. Christopher's Hospital for Babies, $1,000 each, by the will of the late Mrs. Jessie L. Ward.

Presbyterian Hospital, New York, $10,000, by the will of the late Mrs. Jane Livingston Armour.

Princeton Hospital, Princeton, N. J., $40,000, by Mrs. Ida S. Shelton, Ridgefield, Conn., in memory of her husband, Dr. George Shelton.

St. Luke's Hospital, Marquette, Mich., $20,000, by the will of the late Seville H. Morse, Cleveland, and $5,000 from George and Margaret Wallace, Marquette.

CANADA

"Red Water" in Cattle.—"The Pacific Coast Type of Red Water" was the subject of a paper read before a meeting of animal husbandry and agronomy experts and dominion and provincial veterinarians. "Red water" is a mysterious disease which has practically wiped out a herd of sixty-three valuable Holstein Friesians in the last eight years. Bloody urine and a distinct but transitory jaundice are symptoms. The farm on which these cases occurred is near Abbotsford, B. C. The soil is a brown loam and the subsoil, blue clay. Animals sold from affected areas to nonaffected areas do not develop "red water," even when they have shown early symptoms, whereas animals remaining on the affected areas invariably succumb. The investigation made by John R. McKee and Charles S. McKee, M.D., Vancouver, included a study of the feed, soil, symptoms and offspring, postmortem examinations and bacteriologic investigations of the blood and urine. The possibility of the condition being due to a leptospira involving the liver has not been excluded. They believe that "red water" is a type of a deficiency disease due, perhaps, to feed grown on "deficiency land."

Western Canada and Health Insurance.—At the annual meeting of the Canadian Medical Association, Charlottetown, the committee on economics reported that the question of health insurance is coming into prominence through agitation in British Columbia for legislation on this matter. Dr. Horace C. Wrinch, it appears, struck the first note when he advocated health insurance before the British Columbia house. The next move was made by the city of Kamloops, which circularized the municipalities, asking them to consider this question. According to the committee, the government intends to study the question and report at the next session. Public opinion favoring health insurance appears to be a natural sequence to industrial medicine which, the committee says, is in full operation in most provinces of Canada, having appeared first in British Columbia. The committee believes that the "type of state medicine" that operates to some extent in Great Britain and Germany would be totally inadequate in Canada. The medical profession should make strong efforts to insure that they are consulted before any bill on the question of health insurance is prepared for the legislature. The committee recommends that the Canadian Medical Association keep in touch with the situation in British Columbia and obtain expressions of opinion from other provinces. The trades and labor council of British Columbia have endorsed health insurance strongly. The committee, whose report was approved, believes that the medical association should approach labor and maintain cooperation at every step.

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Deaths in Other Countries

Sir Charles S. Tomes, trustee and formerly treasurer of the General Medical Council of England, member of the Central Council of the British Medical Association, and an honorary member of the American Dental Association, October 23, at Aylsham, Norfolk, England, aged 82.

Government Services

Change of Station in the Navy

The surgeon general of the navy has recommended the transfer of Lieut. Comdr. Martin Donelson from Hampton Roads, Va., to the navy hospital, Great Lakes, Ill.; of Lieut. Comdr. Edwin C. Ebert from Haiti to the naval dispensary, Washington, D.C.; of Lieut. Comdr. John R. White from New London, Conn., to the U. S. S. *Bushnell;* of Lieut. John A. Topper from the U. S. S. *Bushnell* to the U. S. S. *Mercy;* of Lieut. Comdr. Thomas A. Fortescue from Great Lakes, Ill., to the naval hospital, New York; of Lieut. Comdr. Andre E. Lee from the U. S. S. *Maryland* to the U. S. S. *Idaho;* of Comdr. Harry H. Lane from the U. S. S. *Idaho* to the U. S. S. *Maryland,* and Lieut. Comdr. Earl C. Carr from the recruiting station, Portland, Ore., to a course of instruction at the University of California Medical School.

Annual Report of Veterans' Bureau

Tuberculosis is the chief cause of death of veterans in government hospitals, according to the annual report of Director Frank T. Hines of the U. S. Veterans' Bureau. Of a total of 3,831 deaths in veterans' hospitals in the fiscal year 1928, 1,753 were attributed to tuberculosis of the lungs. Patients remaining under treatment at the end of the fiscal year numbered 25,899, as compared with 25,310 hospitalized on June 30, 1927. A study indicates that 12,839, or 50 per cent of these patients, are hospitalized for a neuropsychiatric disability; 6,273, or 24 per cent, for tuberculosis, including 228 cases of extrapulmonary tuberculosis, and 6,787, or 26 per cent, for a general medical or surgical disability. There has been a constant decrease in the number of cases of pulmonary tuberculosis under hospitalization, and a similarly constant increase in the neuropsychiatric and general medical and surgical cases. A comparison of the past three years reveals that admissions of veterans for treatment of service-connected disabilities are steadily on the decline, having decreased 39 per cent since 1926. On analyzing the admissions to date of patients under section 202, paragraph 10 of the World War veterans' act, which authority does not question the origin of the disability for which hospitalization is required, there is found a marked increase since the enactment of this legislation. The percentage of these cases to the total admissions at the end of each fiscal year is as follows: 1925, 17.24; 1926, 34.83; 1927, 49.17, and 1928, 62.55. Almost three times as many admissions were authorized under the second provision of section 202 (10) as under the first provision of that section, largely because admissions under the latter authority are limited to certain diseases and conditions, and because the majority of World War veterans admitted to hospitals for tuberculosis and neuropsychiatric diseases, which are specifically mentioned and which form the bulk of admissions under the first provision, have had such disabilities connected either directly or presumptively with military service. On July 1, 1927, the fifty hospitals operated by the bureau had a capacity of 20,810 beds. Classified according to the type of case for which each hospital was principally used, these beds were as follows: tuberculosis, 6,387; neuropsychiatric, 9,219, and general medical and surgical, 5,204. On June 30, 1928, the same number of hospitals were being operated with a total rated capacity of 22,156 beds. Practically all of this increase of 1,346 beds was at hospitals devoted largely to the treatment of neuropsychiatric diseases. General Hines reiterated his proposal that there be established a separate department to handle all matters affecting the extension of direct benefits to veterans and to the dependants of veterans.

Annual Report of Surgeon General of Army

In the annual report of the surgeon general of the army, submitted to the secretary of war, the health of the army, during the calendar year 1927, is said to have been very satisfactory. The number of admissions per thousand to sick report from disease was the smallest ever recorded for the army, with the exceptions of the years 1925 and 1922. The admission rate from disease was 526.73 per thousand, and the admission rate from external causes, 127.91. The rate of admission from traumatisms has been slightly increasing each year since 1923, largely because of more participation in athletic exercises and the increasing number of motor vehicles in use in the army. General Ireland says that there were no serious epidemics of communicable disease during the year. There were, however, ninety cases of cerebrospinal meningitis, and this caused an increase in the annual death rate of the army. The admission rate for disease was highest in troops serving in the Philippine Islands and lowest from external causes for troops serving in China. The principal causes of admission to sick report from diseases were bronchitis, tonsillitis and gonorrhea. The highest admission rate, excluding the general hospitals, was at Fort Thomas, Kentucky, and the second highest at Fort Slocum, New York. There were 531 deaths among the military personnel during the year. The death rate per thousand for the total army was 4; the rate from diseases only was 2.35. The leading cause of death was suicide (52). Balloon and airplane accidents caused thirty-one deaths and drowning, twenty-eight. The number of days lost from duty by disease, excluding members of the army nurse corps, was 1,193,856. The number of officers retired during the year for disability was seventy-six, of whom sixty-nine were retired on account of diseases and seven from traumatisms. The number of enlisted men discharged on certificate of disability was 2,473, of whom 1,396 were discharged not in line of duty, the disability having existed prior to enlistment in 1,341 cases and being due to misconduct in fifty-five cases. The principal causes of retirement of officers were tuberculosis, arteriosclerosis and ulcer of the duodenum. The most common causes for discharge among enlisted men were dementia praecox, constitutional psychopathic state and mental deficiency.

Annual Report of Public Health Service

Further review of the annual report of the surgeon general of the U. S. Public Health Service, noted in THE JOURNAL, December 15, p. 1903, under the title "Review of World Health Conditions," indicates that the death rate from typhoid in forty-one states in 1927 was 5.5 per hundred thousand of population. This is a remarkable difference from that of 35.9 per hundred thousand of population in the year 1900 in the registration area. The typhoid death rate in this area by 1910 had dropped to 23.5 and by 1920 to 7.8. If the death rate of typhoid of 1900 had prevailed in the year 1927, the number of deaths would have been 36,000 greater than actually occurred. Health officers of twenty-three states reported seventy-three deaths from rabies for the fiscal year 1928. The mild form of typhus fever, formerly known as Brill's disease, was reported from the southeast and southwest sections of the country with sporadic cases in other regions; 267 cases were reported by health officers of ten states in the calendar year 1927. Tularemia has been recognized in at least thirty-one states and in the District of Columbia. Rocky Mountain spotted fever appeared in nine states; more than 200 cases were reported. The surgeon general believes that there were many cases that were not reported. The birth rate in thirty-four states declined from 20.6 per thousand in 1926 to 20.4 in 1927, and the death rate in those states declined from 12.1 to 11.4. The number of lepers segregated at the National Leper Home, Carville, La., was the largest in the history of the institution and at the end of the year 293 patients were under treatment. The public health service furnished treatment in 150 ports of the United States, Alaska, and the insular possessions to 349,199 persons who applied for medical service. In this number were included the American merchant seamen and other legal beneficiaries, numbering 105,159, who received physical examinations for civil service appointment or other reasons not related to treatment. The marine hospitals furnished 1,354,545 patient days in hospital, and 638,794 outpatient treatments. A large program of research was carried on in the Hygienic Laboratory, which continued to be occupied with the subject of tularemia, tuberculosis, undulant fever, typhus fever and smallpox vaccination, the standardization of scarlet fever antitoxin, the inspection of establishments which manufacture biologic products, and a study of the chemotherapy of syphilis and tuberculosis. Cancer investigations took on a wider scope; the studies of leprosy and trachoma were continued. Among the recommendations which the surgeon general makes to improve the public health service is the expansion of the Hygienic Laboratory to provide increased facilities for studying problems in public health, and the early and favorable action by Congress for the coordination of the public health activities of the government. This, the surgeon general believes, will enable the government to meet more effectively and economically its public health responsibilities.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 24, 1928.

Cross-Examined Under an Anesthetic

What may be called the latest development of "third degree" methods is reported in the *Lancet* from Hawaii. An American boy was abducted from his school on some pretext by a man somewhat vaguely described as an "oriental." The boy's father received a letter demanding a ransom of $10,000; he attended at the appointed place and paid the money. Later the body of the boy was found in some bushes. Suspicion fell on a young Japanese, named Kaisan, who had been chauffeur in the boy's family. He was arrested and examined by what in England would be labeled "third degree" methods. He steadily maintained his innocence, even though pressed with questions by expert examiners. In this dilemma the police surgeon administered "a heavy injection of hyoscine [scopolamine] hydrobromide." "The drug produces a twilight sleep from which persons emerge to talk from their subconscious mind and to reveal truths that they had secreted during full consciousness. Under the effects of the drug Kaisan confessed to the writing of the ransom letter, describing in detail the process." But when the effect of the drug wore off, Kaisan repudiated any confession and steadily asserted his innocence. A few hours later a second injection was administered with entirely negative results. At this stage the real murderer was discovered elsewhere, and confessed to the crime. Six years ago Dr. R. E. House of Ferris, Texas, read a paper before the State Medical Association of Texas on the "Use of Scopolamine in Criminology." He suggested that experience obtained in obstetric practice might be turned to account in the detection of crime. He described two tests made on alleged criminals who, while under the influence of the drug, gave answers which, when corroborated, proved their innocence. The drug, by depressing the power of reasoning or imagination, elicited nothing but truthful answers. Why, asked House, should this method not be available in criminology? The *Lancet* says that in this country the answer would be that we have evolved a procedure under which statements made by accused persons to the police are not normally admissible in evidence unless the accused person has first been cautioned in a formula of words. We cannot therefore accept a method that would trick a suspect and catch him off his guard. It would be instinctively repulsive alike to judge, counsel and jury, apart even from the fact that English courts of law are conservatively distrustful of scientific discovery in its application to criminal investigation. To dope a man into confession would be as distasteful as to extract evidence by torture. To this commentary may be added a moral —the danger of relying on such a test. It is said that under the influence of the drug Kaisan confessed to writing the ransom letter. If the real murderer had not been found, one shudders to think what might have happened to this unfortunate Japanese.

A Monopoly in Radium

In a press interview, Mr. A. E. Hayward Pinch, medical superintendent of the Radium Institute, stated that there is a monopoly in radium. A Belgian company controls the Kantaga fields in the Belgian Congo, where there are apparently limitless supplies of the ores which yield radium. The Belgians have driven other fields out of the business, because of their greater supplies, and they now can charge what they like. The process of obtaining radium from the uranium salts is costly but it should not be as much as $60,000 a gram. On the other hand, it has been pointed out that radium is now 50 per cent below its peak price and cheaper than before the war. Therefore, it is argued that the Belgian company has not forced the price up unduly. Sir Berkeley Moynihan, president of the Royal College of Surgeons, says that every effort should be made to reduce the cost of radium in view of the heavy demand for it which will soon arise and of the fact that human lives and happiness depend on its possession. There is a moral responsibility on those who deal in it not to obtain an exorbitant profit. The amount required to deal with a case of cancer of the breast costs $7,500, but radium practically lasts forever. Therefore its benefits are eternal. Lord Knutsford, chairman of the London Hospital, has also complained of the price of radium. The other day a patient ordered radium treatment by a surgeon could not obtain it at the hospital because the hospital did not have the radium.

Sir William Milligan, laryngologist and honorary secretary of the Manchester Radium Institute, advocates a national radium service. Centers in which treatment could be carried out on a large scale should be established in the main centers of the population throughout the country. If government assistance was obtained, he contends, the country's radium supplies could be coordinated and further supplies purchased. After mentioning that Colorado mines were closed owing to the competition of the Belgian Congo, from which the best radium is obtained, he suggests that it would not be unreasonable to approach the Belgian government, which is making large profits from the sale of radium, to endeavor to induce it to reduce the price. The policy of buying small quantities for an institution, say $5,000 or $10,000 worth, was merely a waste of money, and in order to make the best use of it the employment of specially trained laboratory assistants is necessary. The old idea of utilizing large doses of radon for short periods of time had been almost entirely given up. The result of this change in treatment is that more radium is required owing to the tubes being kept in the human tissues for a much longer period than formerly.

Road Accidents and Noises

The home secretary, Sir William Joynson-Hicks, as president of the national "Safety First" Association, presided at a dinner held in connection with the Road Safety Congress. Lieutenant-Colonel Ashley, minister of transport and vice president of the association, said that two years ago the first congress was held. A few months afterward he called a conference of local authorities to deal with the appalling number of road accidents in the metropolitan area. Various suggestions were made, but the conclusion arrived at was broadly that reliance must not be so much on regulations as on education. An Englishman could be led much better than he could be driven. The association did not wish to make unnecessary regulations; the easiest road was education, not compulsion. The first congress came to three other conclusions: that there should be propaganda work by means of films and advertisements; that school children should be taught about the dangers to which they were exposed from traffic in going to and from school, and that there should be as many local branches of the "Safety First" Association as could be established without undue expense. A good deal of progress had already been made and the movement had received much widespread support. This month he was having a conference to try to see the best way of dealing with accidents at crossroads. It seemed to him that the old rule of giving way to more rapidly moving cars on the right or left was the best. Some people said that there should be major and minor roads, and that the persons who came out of the minor road should look out and give way to the man on the major road. He was not in favor, except as a last resource, of saying to motorists on the main road that they could go as fast as they liked, and disregard all crossroads. That would be a very dangerous rule.

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THE NOISE NUISANCE

The association had had the noise nuisance under consideration for some time. It hoped to move in two directions—one toward eliminating unnecessarily noisy horns in urban areas and the other toward stopping the wicked and ceaseless clatter of the half-worn tire and flapping sideboard of the motor lorry, which not only unnerved the sick but prevented the sleep of the healthy. The association could not hope to cure the evil but it would do its best to mitigate it, for the nuisance was intolerable. The home secretary said that the minister of transport had a comparatively easy task in making regulations; his was the much more difficult one of carrying them out. It would be impossible to get the increasing traffic through the streets as they now existed. In ten years there had been 864,000 street accidents, of which over 33,000 were fatal. There had been something like 154,000 street accidents last year. One third of the accidents happened to children. In seven or eight years more than a million new vehicles and drivers had come on the road, and in the next seven years two millions might be expected, all adding to the possibility of accidents.

CAUSES OF FATAL ACCIDENTS

A careful analysis had been made of the causes of fatal accidents. Only about 6.5 per cent could be attributed to the condition of the roads, which were improving year by year. Only 5 per cent were due to defects in vehicles, and 3 or 4 per cent might be due to the vagaries of the weather. That left about 80 per cent unaccounted for, and they were due to the human element—inattention of the driver or the pedestrian. These were accidents which could not be prevented by the minister of transport or the local authorities. They could be prevented only by increased education of the public. The association wanted to find out the root cause of the 80 per cent, and had been trying, with the assistance of coroners, to tabulate the causes. It could not go on. The hospitals were being overcrowded. Forty per cent of the accidents were due to the motor driver and about 35 or 40 per cent to the pedestrian. The home secretary had been told that the fast driver was essentially a careful driver, but it was quite clear that 11 per cent of the accidents in 1926 were due to excessive speed. It was not regulation or legislation that was wanted but the getting into the mind of the motorist the fact that he must put himself into the position of the man on the road, and rid himself of the selfish idea that the road belonged to him and that he could go as fast as he liked. There was also the question of "cutting-in"—a very dangerous proceeding.

PARIS

(From Our Regular Correspondent)

Oct. 17, 1928.

The Congress of Legal Medicine

The thirteenth Congrès français de médecine légale, which was held simultaneously with the Congrès de chirurgie, in another building of the Faculté de médecine, took on a peculiar aspect this year. Instead of considering the usual medicolegal questions, it devoted itself chiefly to social medicine, industrial accidents, and occupational diseases, thus encroaching, to a certain extent, on the Congrès d'hygiène. In that respect, it has undergone the same transformation as the ministry of health, which, owing to the fact that it is now combined with the ministry of labor, is confronted more and more with social problems. The session was presided over by Dr. Georges Brouardel, physician to the Hôpital Necker and member of the Academy of Medicine—a nephew of the eminent medicolegalist Paul Brouardel, who was dean of the Faculté de Paris for many years. He was aided by M. François, surgeon to the "hôpitaux de Bruxelles"; Dr. Rocher, professor at the Faculté de médecine de Bordeaux; M. Etienne Martin, professor at the Faculté de médecine de Lyon, and M. Michel, professor at the Faculté de médecine de Nancy. The minister of health and labor presided at the opening session. M. Balthazard, professor of legal medicine at the Faculté de Paris, presented a paper on expert examinations in connection with the application of social insurance laws, in which he emphasized the difficulties associated with such application, which will necessitate an increase in the number of officials. He stressed, further, that the impartiality of so large a number of expert examiners, recruited to a great extent from a milieu in which they have many private patients, will often be subjected to a severe test. MM. Charbonnel and Massé of Bordeaux gave an account of the comparative results of external methods and osteosynthesis in the treatment of fractures of the leg, from the standpoint of the later industrial efficiency of persons injured in the industries. They concluded that osteosynthesis is preferable, but there is no legal way of compelling a workman to accept an operation that, by improving his efficiency, would diminish his compensation. M. Duvoir of Paris considered occupational poisoning from hydrocarbons, a question that affects the whole personnel of the automobile industry. M. de Laet of Brussels read a paper on the occupational pathology of radioactive bodies. M. Fribourg-Blanc's communication treated of the mental disorders and the antisocial reactions constituting the sequelae of epidemic encephalitis. The last meeting was held in the amphitheater of the Institut médico-légal, recently constructed on the site of the old morgue, and afforded the conventionists an opportunity to inspect the arrangements that have made the amphitheater an exemplification of all the recent advances in science. On the occasion of the congress, the Société de médecine légale de France held a special meeting in the Palais de justice, at which Professor Claude delivered a lecture on the measures of legal protection to be adopted in behalf of patients with paresis who have been cured by the new methods. The problem is a delicate one, for one cannot yet be sure that they are definitely protected against a relapse.

The Congress of Health

The fifteenth Congrès d'hygiène, organized by the Société de médecine publique, convened, October 15, in the amphitheater of the Institut Pasteur, under the chairmanship of M. Brisac, director of the Office national d'hygiène sociale. The opening session was presided over by M. Loucheur, minister of health and labor. Several important questions were discussed. One that is causing the public authorities and the hygienists serious concern is the problem of the new outlying subdivisions, the so-called *lotissements*. Owing to the lack of apartments and the increase of the urban population, a new form of commercial enterprise has developed, particularly since the war, which now appears to be fraught with considerable danger from the standpoint of health. Real estate firms buy up large areas just outside the cities, which the owners are constrained to sell by reason of being overburdened with taxes. These parcels of land are divided up into lots, and many workmen and small salaried employees, influenced by the extensive advertising of these subdivisions, purchase lots for the construction of small homes. Often the real estate firm builds the houses itself. There are at present a large number of these subdivisions in the vicinity of Paris, being occupied by more than 200,000 persons. But, unfortunately, as a general thing, the real estate firm considers it has done all that can be expected of it when it has sold the parcel of land, together with the houses thereon, in certain instances, and has realized a handsome profit. However, in the areas thus subdivided there are no practicable roads or streets, no sewers, no water system, no gas and no electricity. During the rainy season, the roads are impassable. These parcels of land are commonly situated within the jurisdiction of small communes having originally but few inhabitants and being financially unable to undertake the necessary improvements. The new owners are likewise too poor to launch the vast

enterprises that are needed. The population of these subdivisions lives, therefore, under poor hygienic conditions. In 1924, an order of the minister forbade notaries to draw up sales contracts for such subdivided property without a certificate of the mayor attesting that, in the addition concerned, all the requirements of hygiene had been fulfilled. But the real estate firms have been skilful in evading the laws. The mayor signs the certificates required without inquiring carefully into the situation. The law makes him responsible for the hygienic conditions in his commune but does not furnish him with means of execution and does not provide a penalty for neglect of duty on his part. Sometimes the real estate firm seeks to avoid the issue by stating that it is selling its lots as garden tracts. If, later on, the new owner builds a house on his tract, the real estate firm has no further responsibility in the matter. The minister of the interior, M. Serraut, had a law passed, last year, destined to remedy this situation. According to this law, the owners of parcels of land on which new suburban towns are laid out are privileged to form a syndicate. The state assumes half of the cost of hygienic improvements and charges the other half to the syndicate, but advances the funds to be paid off in thirty years by a process of amortization. In spite of this advantageous offer, which throws a heavy burden on the government's annual budget, many owners refuse to form a syndicate, entertaining the hope that the government will eventually assume all the expense. With the opening of the Congrès d'hygiène, M. Henri Sellier pointed to this situation as constituting one of the most serious menaces to public health at the present time. He expressed the opinion that the state has done its full duty, and that the only source of betterment lay in inculcating a better spirit in the population by means of publicity campaigns.

Further questions submitted for the consideration of the congress were the relations of private enterprises to the state in the domain of public and social hygiene, which was presented by Dr. Dequidt; the plan for the extension of cities; colonial and maritime hygiene, and the prophylaxis of tropical diseases. Professor Brumpt gave an interesting account of the rôle of the genus of fish *Gambusia holbrooki*, in North America, in the fight against malaria. M. Kanony described the organization of the quarantine service in Egypt; Colonel Doreau, M.D., spoke of the crusade against trypanosomiasis in the French colonies; MM. Pettit, Stefanopoulo and Frasey discussed the serotherapy of yellow fever.

AUSTRALIA

(From Our Regular Correspondent)

Nov. 13, 1928.

Hospital and Health Finance in Queensland

A unique feature of hospital finance in Queensland is the operation of a state lottery known as the "golden casket." It is a veritable fairy godmother to struggling institutions. For the financial year 1927-1928 (to which period all subsequent amounts apply), the disbursement from the golden casket fund amounted to £335,610, of which £160,727 relieved the state government of approximately half its annual endowment of hospitals and ambulance brigades. The remainder of the disbursement was applied to the bush nursing association; an aboriginal hospital; the erection of maternity wards and baby clinics (£19,927); an aged people's home (£15,000); the purchase of official motor cars for baby clinic nurses; a hospital sewerage scheme, and a grant to the Queensland cancer campaign (£2,000).

The golden casket is drawn as soon as 100,000 tickets at five shillings and threepence ($1.10) each are subscribed, which at present occurs every eleven days. The first prize is £5,000, the second £1,000 and the third £500, and there are numerous smaller prizes. Tickets are purchased all over Australia, but mainly in New South Wales and Queensland. The commonwealth government is placed in an anomalous position with regard to the golden casket, as the postoffice, which it controls, refuses to deliver mail to a similar equally extensive but privately conducted lottery in Tasmania known as "Tattersalls." No such embargo is placed on the delivery of mail to the Queensland state lottery. The ethics of such a manner of raising funds even for charitable (?) purposes is not above dispute. The best that can be said is that the method should be beneath the dignity of a government. It is significant that voluntary contributions to hospitals are at a much lower ebb in Queensland than in Victoria. In the latter state the government has been making almost yearly endeavors to introduce the "totalizator" (a machine method of making bets) at the race courses for the purpose of financing hospitals, but Victorian public opinion is strong against such a measure. In Queensland, the totalizator has long been a commonplace, the annual revenue from which (totalizator and betting tax, £98,396) is paid into general revenue.

As an instance of how Melbourne voluntarily supports its hospitals, during the annual "hospital Saturday and Sunday" collections this year, an amount of nearly £50,000 was received. Such an event has no parallel in Queensland.

The population of Queensland is approximately 900,000. Of this number, 33 per cent reside in Brisbane, and 51 per cent in all cities.

Public Hospitals of New South Wales

The hand-to-mouth, cap-in-hand existence of the great majority of New South Wales hospitals is as unfavorable to their success as it is unfair to their managers. The present hospital position throughout Australia is tending to break down under its own weight. During the last decade, the subsidies that the state government has been called on to pay have increased disproportionately to the increase of the population. In New South Wales, 20 per cent of the population availed itself of hospital facilities, whereas only 10 per cent of the Victorian population did so. No variation in the health of the two states can in any way account for this discrepancy. For the year 1926, hospital patients of New South Wales paid an average of seven shillings and tenpence ($1.65) per head for treatment, against thirteen shillings and fivepence ($3.05) in Victoria. Undoubtedly, the public hospitals are being exploited in a manner that was never intended. The medical profession, as well as the state governments, suffer by the situation. It is unreasonable to expect members of the medical profession, who give their services freely to the sick poor, to give the same services to those who are not poor. Generally speaking, the medical staffs are honorary, and the high standard of medical care never varies, whatever the financial position of the patient. The intermediate or community hospital is the theoretical solution, but the individual financial inquiry and consequent assessment is fraught with many practical difficulties, especially in the outpatient department. The greatest of these difficulties arises from the dishonesty of some of the applicants for treatment.

Noise and Health

Melbourne has led the way in Australia toward the reduction of unnecessary noise. That this should be so is not unnatural in view of the fact that the Melbourne Hospital is situated almost in the center of the city and has dense traffic routes (including tram lines) on three sides of the building. The hospital has been described as an island in a sea of noise that militates against the welfare of the patients. Such diagnostic procedures as auscultation of the chest, under these circumstances, are rendered difficult. Adventitiae due to motor horns, tram bells, street musicians and other auditory insults occur at all phases of the cardiac cycle. It is not unnatural, also, that an honorary medical officer of the Melbourne Hospital should spend the time that he otherwise would have spent unprofitably

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with his stethoscope in organizing a noise abatement league. The newspapers have given considerable publicity to the movement; the wireless broadcasting stations have sent out the discordant jangle by means of a microphone placed at a busy intersection, and a valuable benefaction to the hospital has now been held back until the trams have been removed from two of the sides of the hospital. Rather analogous to the quandary of the Irishman who could not decide whether to clean out his stable or raise the roof is the question of removing the Melbourne Hospital to a less noisy area, which is again being raised for the *n*th time.

Medical Research in the Pacific

As the direct outcome of a decision at the Pacific Health Conference, held in Melbourne in 1926, between representatives of the powers having interests in the Pacific, the League of Nations has appointed a commission to investigate the medical situation in the Pacific islands, whose function it will be to initiate or promote schemes for coordinating medical research. Since the main interests in the Pacific are British and French, the two medical commissioners appointed represent these two powers. They left Sydney, October 27, for Fiji, New Caledonia and the New Hebrides. Next year they will again leave Sydney to visit Papua, the mandated territory of New Guinea, and the British Solomon Islands. The French commissioner, Dr. P. H. Hermant, is a distinguished officer in the French colonial medical services, having spent twenty-eight years in various parts of French Indo-China. This period was interrupted only by war services in France. For the past four years he has been traveling in Japan, China, India and Iraq in the service of the bureau of the League of Nations. He is a member of the Order of the Legion of Honor. The British member of the commission is a medical officer of the Australian Commonwealth Department of Health.

A bureau of the League of Nations to deal with health problems in the islands of the Pacific has been established at Canberra. The function of this bureau will be to develop the collaborative spirit among national medical authorities, so that not only may the prevalent diseases be checked, but the importation of disease be prevented.

BUENOS AIRES

(From Our Regular Correspondent)

Oct. 30, 1928.

Prevention of Leprosy

The national congress has passed a law, drafted by Professor Aberastury, requiring the isolation and treatment of lepers. Professor Baliña has proved that there is a gradual increase in the disease and estimates that if proper measures are not taken there may be as many as 500 new cases a year. Several years ago a special committee urged a drive against disease, but until now such a procedure has not been possible, since every province has succeeded in preventing the establishment of leper colonies within its territory. The province of Corrientes, which has the greatest number of lepers, has been foremost in frustrating such attempts. It actually managed to stop the building of a large leprosarium on the island of Cerrito in the territory of Chaco, near the city of Corrientes. The national government, however, has finally ordered the building to be continued, and has now decided to establish five leprosariums in different parts of the country.

A census of the lepers is to be taken. It is estimated that there are 5,000 in the country. The treatment of leprosy is made difficult owing to a lack of hospitals for this purpose. There is only one, the Muñiz Hospital (of the federal capital), which has special rooms for leprous patients. There are now more than 200 inmates receiving care at this hospital. It is known that many of these patients have escaped and mingled with the public at all kinds of local functions and celebrations.

At this particular time the public is quite concerned about these difficulties, as a result of newspaper articles and of certain dramatic incidences; for example, a mother killed her daughter when she discovered that she had leprosy, and her cousin killed his sister, who also had leprosy, and then committed suicide.

Now that the national department of hygiene has passed the necessary law, the success of the campaign depends only on the cooperation of the national government.

Resignation of Prof. Araoz Alfaro

Prof. G. Araoz Alfaro, a distinguished physician, has just resigned in accordance with the law which requires the retirement of those who have given thirty years of active service and twenty years of university teaching. He could accept a special prolongation of five years, but he did not wish to propose this to the faculty board of directors, preferring to leave the teaching position open to one of his pupils. Prof. C. Bonorino Udaondo was selected to take his place.

Professor Araoz Alfaro has now accepted the superintendency of a private institute of diagnosis, after having rejected the presidency of the national department of hygiene.

University News

As a result of the student strike caused by political differences, the medical faculty of Rosario has discontinued its courses for this year. The graduate university council threatened to interfere in the affairs of this school, but the chairman vetoed the measure, and has asked that the national government intercede instead.

The students of Cordoba are still on strike. The head of the university, who is in favor of this movement, requests the national government to influence the faculty in the students' behalf. The unusual petition of the students was explained in a former letter.

The University of Buenos Aires is the only one that is still functioning. It has voted to raise the salary of 300 pesos, which its professors are now receiving, to 400 pesos. The medical faculty members complain that they were previously supposed to be given all the professional fees paid by the alumni, but these are now partially retained by the university. Probably both matters will be settled satisfactorily, but certain factions are attempting to make them a political issue and to incite the students.

Fourth National Congress of Medicine

Dr. José Arce presided at a recent meeting of the committee in charge of the arrangements for the fourth national congress of medicine, to be held at Buenos Aires in 1930. At the next meeting the program of the congress will be outlined and the various representatives appointed.

National Academy of Medicine

The National Academy of Medicine has held scientific meetings every month, and the sessions have been unusual, with such speakers as Profs. G. Marinesco of Bucharest, Hartman, Sergent and Tiffeneau of Paris, Jakob of Hamburg and Orrico of Cordoba. The members of the society have given individual lectures, such as that of Professor Baliña on leprosy, and the one by Professor Castex on arterial hypertension.

Building operations, to which the national government has contributed 200,000 pesos, will soon be started by this institution on land donated by the Herrera Vegas.

Brazilian Medical Conferences

Many Argentine physicians attended the recent Brazilian medical conferences. The medical society of Argentina sent its secretary, Manuel Luis Perez, as well as Profs. A. Ceballos

and D. Brachetto Brian, and Dr. C. H. Niseggi. Among others who attended were Dr. and Mrs. Gaudino, and the obstetricians Falsía and Etcheverry, who were favorably impressed with the hospitality of the Rio de Janeirians and likewise with the developments in medicine that were disclosed.

Lectures

Professor Jacob of Hamburg recently gave a series of neurologic lectures illustrated with anatomicopathologic specimens. Prof. G. Marinesco gave an extensive cycle of lectures on Charcot, Cajal and Marie, and on the subjects of reactivation, rejuvenation, myasthenia, hysteria, and hereditary and familial diseases. Professor Teffeneau conducted a course on antiinfectious and symptomatic chemotherapy, and Professor Sergent gave a series of lectures on the suppurative diseases of the bronchi and pleura.

INDUSTRIAL MEDICINE AND HYGIENE

Under the auspices of the Museo Social Argentino, which is affiliated with the university, a series of lectures was given by Drs. Zwanck, Rodriguez, Bard, Peralta Ramos, Durante Avellanal, Houssay and others on various phases of physiology, hygiene, legislation and industrial medicine. This course is the first of its kind and was attended by numerous industrial employers and employees.

Hospitals

The municipal advisory board of the capital has assigned José Penna to the Nueva Pompeya hospital.

The Ramos Mejía hospital has been renovated and greatly enlarged. It now has a capacity of 1,800 patients. The town has invested 3,000,000 pesos in this hospital, furnishing it with the latest and most modern equipment.

Pan-American Union

Dr. Long has been in this capital twice en route to Montevideo, Paraguay and Chile, in the medical service of the Pan-American Union.

Dr. A. Sordelli, director of the bacteriologic institute of the national department of hygiene, has been appointed by the Pan-American Union and the associated governments to prepare legislative measures for the purpose of regulating the diagnostic material of laboratories and the preparation of biologic products. This will require the cooperation of the various South American governments.

BERLIN

(From Our Regular Correspondent)

Nov. 10, 1928.

The 1927 Status of Krankenkassen Organized Under Federal Law

In number 12 of *Wirtschaft und Statistik*, the federal bureau of statistics publishes a report on the financial status of the federally constituted *krankenkassen*, for the year 1927. Unfortunately, the report covers only 71 per cent of the *krankenkassen*, so that the results give only an approximate idea of their actual development. The total receipts of the federal *krankenkassen*, including the health insurance societies of the miners, amounted, in 1927, to 1,634,000,000 marks ($388,892,000). The total expenditures were 1,500,000,000 marks ($357,000,000). The total receipts were about 13 per cent and the total expenditures about 16 per cent higher than in 1926. In dues alone, 1,600,000,000 marks was received, as compared with 1,425,000,000 marks the previous year, which is explained by the increased incomes of the insured and the advancement of the limit of income necessitating enrolment in the *krankenkassen*, from 2,700 marks ($642.60) to 3,600 marks ($856.80). The reason for the increased expenditures lies in the increased number of performances and in the expense for each performance: cash benefits, hospital care, physician's fees, and the cost of medicines.

The morbidity was higher than in 1926. There were 230,000,000 days of illness (associated with inability to work), as contrasted with 212,000,000 days for the previous year. The general decrease in the birth rate affected the insured to a considerable extent. The births were 5.6 per cent less than in 1926, while the deaths increased 3.1 per cent. The total expenditures were made up of the following items: care of the sick, 1,300,000,000 marks; cash benefits to puerperal women, 70,000,000 marks; death benefits, 16,000,000 marks, and administrative expenses, 100,000,000 marks.

An Occupational Disease of Silk Workers

The ophthalmologist Prof. Adolf Gutmann of Berlin has treated, for several years, the workmen in an artificial silk factory, and has found in them many cases of involvement of the conjunctiva and cornea consisting in marked sensitiveness to light, smarting, and inflammation. In order to discover the cause of these disorders, he inspected the factory and found that all the workmen presenting these manifestations were stationed at a certain place where the viscous product resulting from the chemically converted cellulose is pressed through a pipe with a sieve-covered outlet into a reservoir containing an 8 per cent sulphuric acid solution. Here is where the artificial silk thread enters its first raw stage, and even at this point a few slender threads can be drawn from the mass resulting from the action of the sulphuric acid on the aforementioned viscous product. Although good ventilators and suction devices are placed over the reservoir, a number of the workmen develop eye disorders, while others are not affected. Gutmann inquired further into the development of this occupational disease and has an article on the subject in the *Deutsche medizinische Wochenschrift*. In the air about the reservoir there are three gaseous substances that may affect the eye: carbon disulphide, sulphuric acid vapors, and hydrogen sulphide. Carbon disulphide may cause grave disturbances of vision, but not such small quantities as are contained in the air about the reservoir. The sulphuric acid vapors also are so highly diluted that they cannot have any direct irritative effect on the conjunctiva or cornea. The gaseous hydrogen sulphide, however, produces severe stinging and smarting sensations in the eyes. Healthy workmen do not develop inflammations of the eye unless the air contains more than 0.05 per cent of it, but workmen who have previously had inflammations of the conjunctiva or cornea, or who are otherwise predisposed, develop disorders when the content ranges between 0.01 and 0.05 per cent. The author demands, therefore, that, if the air is found to present a hydrogen sulphide content of more than 0.05 per cent, the ventilators and the suction apparatus must be improved and that persons who have had such eye disorders previously, or are otherwise predisposed owing to constitutional weakness, shall not be stationed at this point in the factory.

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Marriages

LUCIUS LORIN TAYLOR, Waupun, Wis., to Mrs. L. C. Johnson of Watertown, S. D., at Orangeville, Ill., September 7.

IRWIN KJELLAND KROHN to Miss Isadore A. Barber, both of Black River Falls, Wis., at Warrens, August 20.

MANFRED JOSEPH GERSTLEY to Miss Dorothy Pauline Weimann, both of New York, November 21.

WALTER AGNEW THOMISON, Dayton, Tenn., to Miss Shirley Gaskins of Hazelhurst, Ga., December 4.

JOSEPH BERNARD RYDZEWSKI to Miss Julia B. Wloszczuk, both of Detroit, October 10.

NEIL ANDREWS to Miss Myrtle Hyde, both of Oshkosh, Wis., August 24.

Deaths

Frank Emory Bunts ✠ Cleveland; Medical Department of Western Reserve University, 1886; served during the Spanish-American War and in France during the World War; professor of the principles of surgery and clinical surgery at his alma mater; chief of staff of St. Vincent's Charity Hospital; on the staffs of the Cleveland City, Mount Sinai and the Lutheran hospitals; member of the American Surgical Association, the Société Internationale de Chirurgie, the Association of Military Surgeons of the United States and the Mississippi Valley Medical Association; aged 67; died suddenly, November 28, of heart disease.

Frank W. Fleischaker ✠ Louisville, Ky.; Medical Department University of Louisville, 1900; professor of medicine and formerly lecturer on physical diagnosis at his alma mater; on the staff of the Louisville City Hospital and the Louisville Jewish Hospital; aged 51; died at St. Joseph's Infirmary, November 26, of heart disease following a recent surgical operation.

Henry Van Hoevenberg ✠ Kingston, N. Y.; Bellevue Hospital Medical College, New York, 1872; medical inspector in public schools of Kingston; health officer of the town of Ulster; of the staff of the Kingston Hospital; formerly superintendent of the Ulster County Tuberculosis Hospital; aged 78; died at the Kingston Hospital, October 28.

Henry Mortimer Stuckey ✠ Sumter, S. C.; Medical College of the State of South Carolina, Charleston, 1891; past president of the Sumter County Medical Society; formerly on the staff of the Tuomey Hospital; aged 61; died, November 18, at St. Elizabeth's Hospital, Richmond, Va., of sarcoma of the ileum and endocarditis.

Gustav Scholer, New York; Medical Department of the University of the City of New York, 1885; member of the Medical Society of the State of New York; formerly coroner and for many years member of the board of managers of the Manhattan State Hospital; aged 77; died, December 1, of heart disease.

Robert Johnstone Blanchard, Winnipeg, Canada; University of Edinburgh, 1877; past president of the Canadian Medical Association; emeritus professor of surgery at the University of Manitoba Faculty of Medicine; served during the World War; aged 75; died suddenly, September 10.

Howard Hamilton Smith, Yakima, Wash.; Cleveland University of Medicine and Surgery, Cleveland, Ohio, 1895; for eight years city and county health officer; member of the Washington State Medical Association; aged 61; died suddenly, November 7, of heart disease.

Robert D. Cohn, San Francisco; University of Heidelberg, 1896; formerly of the staff of the Mount Zion Hospital; member of the California Medical Association; aged 56; was killed, November 30, when he fell from a fourth story window in Oxford, England.

Elijah B. Walker, Savannah, Tenn.; Medical Department University of Tennessee, Nashville, 1890; member of the Tennessee State Medical Association; aged 68; died suddenly, while seated in his automobile in front of his office, November 28.

Max Otto Kline ✠ Los Angeles; University of Pennsylvania School of Medicine, Philadelphia, 1921; on the staffs of the Los Angeles General, Hollywood, Children's and the Kaspare Cohn hospitals; aged 30; died suddenly, September 22.

Charles Ray Otis, Dundee, N. Y.; Columbia University College of Physicians and Surgeons, 1896; member of the Medical Society of the State of New York; aged 57; died, November 28, of injuries received in an automobile accident.

James Israel Tyree ✠ Joplin, Mo.; University of Pennsylvania School of Medicine, Philadelphia, 1914; served during the World War; on the staffs of St. John's and Freeman hospitals; aged 38; died, October 25, following an appendectomy.

Mary Elizabeth Speers-Gillette, Marshalltown, Iowa; Hahnemann Medical College and Hospital, Chicago, 1889; aged 79; died at the Independence State Hospital in November, following cerebral hemorrhage suffered some weeks ago.

I. Carson Smith ✠ Stockton, Ill.; College of Physicians and Surgeons, Keokuk, Iowa, 1884; past president of the Jo Daviess County Medical Society; president of the school board; aged 68; died, November 8, of pernicious anemia.

Frank Parker Marshall ✠ Fond du Lac, Wis.; Marquette University School of Medicine, Milwaukee, 1914; served during the World War; aged 48; died, November 10, at the Wisconsin General Hospital, Madison, of cerebral embolus.

Claude F. Riden, Bostwick, Ga.; Southern Medical College, Atlanta, 1887; member of the Medical Association of Georgia; formerly member of the state legislature; aged 61; died, November 26, following a long illness.

Albert Franklin McClusky ✠ Buhl, Idaho; Colorado School of Medicine, Denver, 1906; aged 50; died, November 27, of epidemic cerebrospinal meningitis, contracted during the course of an epidemic in that community.

Thomas J. McKenzie, Anaconda, Mont.; Louisville (Ky.) Medical College, 1889; member of the Medical Association of Montana; past president of the Deer Lodge County Medical Society; aged 61; died in November.

Joseph Peyton Fearington ✠ Winston-Salem, N. C.; University of Maryland School of Medicine, Baltimore, 1887; aged 66; died, November 23, at his home, of pneumonia, chronic nephritis and heart disease.

Thomas Walter Foster, Tchula, Miss.; Medical Department of the University of Louisville, 1876 member of the Mississippi State Medical Association; aged 78; died, November 27, following a long illness.

Clarence Edmonds Hemingway ✠ Oak Park, Ill.; Rush Medical College, Chicago, 1896; on the staff of the Oak Park Hospital; aged 57; died at his home, December 6, of a self-inflicted gunshot wound.

Edward George Benson, Albany, N. Y.; Albany Medical College, 1907; aged 49; died at St. Peter's Hospital, November 22, following a fracture of the spine, the result of falling downstairs at his home.

Theodore Reagan, San Diego, Calif.; Rush Medical College, Chicago, 1893; practiced for many years at Danville, Ill.; aged 63; died at Oak Park, Ill., as the result of paralysis which occurred in June.

William E. Pricer ✠ Ironton, Ohio; Starling Medical College, Columbus, 1877; Jefferson Medical College of Philadelphia, 1879; aged 73; died, in November, at the University Hospital, Columbus.

Ernest Albert Clark, Ann Arbor, Mich.; University of Michigan Homeopathic Medical School, 1890; formerly physician to the county jail; aged 63; died, August 25, of carcinoma of the throat.

Carlisle Marshall Denney, Middleton, Mich.; Chicago College of Medicine and Surgery, 1911; member of the Michigan State Medical Society; aged 41; died, November 29, of pneumonia.

Arthur Wayne Boda ✠ Bowerstown, Ohio; Ohio State University College of Medicine, Columbus, 1925; aged 30; died, November 3, of burns received when his automobile was wrecked.

Frank Pence Stafford, Lima, Ohio; Ohio Medical University, Columbus, 1896; member of the Ohio State Medical Association; aged 56; died at his home, November 5, of heart disease.

George Morton Prentice, Lake Worth, Fla.; State University of Iowa College of Medicine, Iowa City, 1881; aged 75; died, November 4, at the Good Samaritan Hospital, West Palm Beach.

Ora Manly, Highland, Mich.; University of Michigan Medical School, Ann Arbor, 1879; aged 74; died, November 24, of injuries received in an automobile accident a few days before.

William J. Ham, Creve Coeur, Mo.; St. Louis College of Physicians and Surgeons, 1898; member of the Missouri State Medical Association; aged 62; died, November 6, of nephritis.

Merton E. Marvin ✠ Luzerne, Pa.; Jefferson Medical College of Philadelphia, 1896; aged 56; died, November 20, at the Wilkes-Barre General Hospital, following an operation.

George B. Homan, St. Louis; Missouri Medical College, St. Louis, 1873; member of the Missouri State Medical Association; aged 84; died, November 15, of bronchopneumonia.

Benjamin Hart Matthews ✠ Denver; Colorado School of Medicine, 1906; on the staff of St. Joseph's Hospital; specialist in bacteriology; aged 56; died at his home, October 30.

George Bernhard Owen, Polson, Mont.; University of Minnesota College of Medicine and Surgery Minneapolis, 1900; served during the World War; died, October 28.

Allen Pierson ✠ Spencer, Ind.; Indiana Medical College, Indianapolis, 1878; secretary of the Owen County Medical Society; aged 78; died, October 22, of acute bronchitis and uremia.

Egbert A. Watters, Fort Worth, Texas; University of Texas School of Medicine, Galveston, 1896; aged 68; died, October 11, at the Harris Hospital, of bronchopneumonia.

Malcolm Seymour ✠ Boston; Harvard University Medical School, 1904; served during the World War; aged 50; died, November 17, at the Massachusetts General Hospital.

Alfred Clifford Ball ✠ Alliance, Ohio; Medical Department of Western Reserve University, Cleveland, 1895; aged 66; died, November 30, of cerebral hemorrhage.

William W. Lessley, Carencro, La.; Medical Department, University of Louisiana, New Orleans, 1871; aged 80; died at his home, November 21, following a long illness.

William Everett Brownell, Elgin, Ore.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1875; veteran of the Civil War; aged 86; died, November 5.

Ira Applebee ✠ Albany, N. Y.; Albany Medical College, 1897; for ten years physician to the Albany Fire Department; aged 53; died at his home, November 12.

James J. Duffy, Moundsville, W. Va.; Baltimore University School of Medicine, 1891; aged 71; died at his home, November 19, of cerebral hemorrhage.

Byron Pierce, Coopers Plains, N. Y.; University of Buffalo School of Medicine, 1861; aged 89; died at the home of his son in Rochester, November 27.

Elijah Hart Hill, Pittston, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1889; aged 62; died at his home, November 16, of heart disease.

Howard Ray Heckert ✠ Akron, Ohio; University of Cincinnati College of Medicine, 1913; served during the World War; was found dead, December 2.

William W. McBurney, Stambaugh, Mich.; Detroit College of Medicine and Surgery, 1892; aged 59; died, November 28, following a long illness.

Albert Francis Randall, Port Huron, Mich.; Detroit Homeopathic Medical College, 1873; aged 79; died, November 22, following a long illness.

Frank B. Harris, Canton, N. J.; Eclectic Medical Institute, 1886; aged 69; died, November 2, following a cerebral hemorrhage suffered some time ago.

John V. Lesnet, Montpelier, Ohio; University of Wooster Medical Department, Cleveland, 1880; formerly health officer; aged 82; died, October 22.

Samuel W. Lytall, Quinlan, Texas; Chattanooga (Tenn.) Medical College, 1905; aged 54; died, November 12, of nephritis and cerebral hemorrhage.

Samuel Montgomery Leeper, Fredonia, Ky.; Miami Medical College, Cincinnati, 1873; aged 80; died suddenly, November 30, of heart disease.

Luman G. Griste, Willoughby, Ohio; Homeopathic Hospital College, Cleveland, 1874; aged 83; died, October 6, at the home of his daughter.

G. Burton Harris, Lansing, Mich.; Detroit Medical College, 1880; aged 75; was found dead in his room, November 27, of heart disease.

Edward Nicholas Liell ✠ New York; Bellevue Hospital Medical College, New York, 1884; aged 69; died, December 5, at Atlantic City.

Charles E. Barninger ✠ Mendon, Mich.; Chicago Homeopathic Medical College, 1894; aged 63; died, November 24, of heart disease.

Thomas Simeon Rosengrant, Barnesville, Ohio; Columbus Medical College, 1883; aged 70; died, November 13, of heart disease.

Moses Stearn, Philadelphia; Baltimore University School of Medicine, 1889; aged 82; was found dead in bed, recently.

Alfred W. Coleman ✠ Davenport, Okla.; Colorado School of Medicine, Boulder, 1888; aged 72; died, November 16.

Emma A. Lewis, Red Bluff, Calif.; Cooper Medical College, San Francisco, 1899; died, May 15, of heart disease.

Oliver Perry Low, Portland, Ore.; University of Oregon Medical School, 1896; aged 66; died in November.

John P. Sims, Friendship, Tenn.; Memphis Hospital Medical College, 1890; aged 68; died in November.

Royal Alfred McClure, Seattle; Chicago Medical College, 1893; aged 62; died, November 12.

Bureau of Investigation

HAIR-A-GAIN

An Alleged Enhancer of Beauty, Sheen, Luster, Color, Texture, Contour and Abundance of the Scalp and Hair

Georgia O. George of Los Angeles is the "Inventor, Originator and Sole Manufacturer of Hair-A-Gain Scalp and Hair Shampoo and Mask O'Uth Liquid Mask and Scientific Systemethod." Georgia O. George admits all this. Presumably, this is the same Mrs. George that the papers in April, 1916, reported as being under arrest in San Francisco for advertising that her preparation would grow hair on bald heads, and attempting to gain her freedom by offering to prove her contention by personal application of her product to the judge's bald head. The newspapers reported: "The court immediately continued the case pending the experiment." Of the outcome, we have no record.

Probably because Georgia realizes that, while the bald-headed contingent may not be quite as susceptible to the wiles of quackery east of the Sierra Nevadas as they are west, they are, nevertheless, numerous enough to make good picking. At any rate, Georgia invaded the East and one may not only have read of the virtues of "Hair-A-Gain" in the newspapers but may have listened to panegyrics on the same subject over WMCA, New York; WHK, Cleveland; WEBH, Chicago; KMOX, St. Louis; KFXF, Denver—not to mention various stations on the Pacific Coast.

The present article does not deal with the "Mask O'Uth," other than to mention the fact that THE JOURNAL has received reports of severe reactions following the use of the stuff. This article is confined to a discussion of "Hair-A-Gain Scalp and Hair Shampoo." Georgia O. George waxes eloquent in the description of Hair-A-Gain. In a typographic style that in its lavish use of capitals reminds one of a Brisbane editorial, Mrs. George declares:

> "NO OTHER SHAMPOO has done so much to enhance the BEAUTY—SHEEN—LUSTRE—COLOR—TEXTURE—CONTOUR—ABUNDANCE—LUXURIANCE and CLEANLINESS of the Scalp and Hair as 'HAIR-A-GAIN' SCALP AND HAIR SHAMPOO.
>
> "'HAIR-A-GAIN' SCALP AND HAIR SHAMPOO and its SCIENTIFIC SYSTEMETHOD makes you feel MORE than clean—it makes you feel IMMACULATE, because it shampoos your SCALP as well as your HAIR."

Hair-A-Gain Scalp and Hair Shampoo is a duplex affair. It consists of a can of paste, or pomade, and a bottle of liquid soap. The paste is to be smeared over the head, covered with wrapping paper and a towel, and left on overnight; the gooey mess is then removed the following morning with the aid of the liquid shampoo. Mrs. George describes her paste as a "penetrating, all-pervading, pore-searching, film-removing" preparation. Some of her literature is distinctly educational in character. We learn from it that "there is constantly, continuously forming on the scalp a smothering film composed partly of worn-out cells of the body and other excremental waste materials"; furthermore, that the scalp also collects "external accumulations, such as dangerous dust, greases and grime" and that the city atmosphere contains "115,000 dirty particles to every cubic foot." As a result, one's scalp gets a "many layered pore-film encrustation." Naturally:

"This crustateous condition of the scalp and hair causes one to feel tired, depressed and nervously exhausted."

But after using Hair-A-Gain, the "hair will become noticeably smoother, cleaner, softer, at once more pliable, and will possess a beautiful colourful sheen and lustre."

It was not long since that Georgia O. George declared that Hair-A-Gain "guarantees positively and absolutely to grow hair . . . to restore the youthful color and texture to live, gray or faded hair." More recently Mme. George has hedged a little on this claim. She now states that Hair-A-Gain "guarantees positively and absolutely to put the scalp in a condition to grow hair . . . to restore the youthful contour, texture and color to faded hair . . . to arouse the dormant pigment." However, the bald-heads and the gray-haired still believe that Hair-A-Gain will both grow hair and

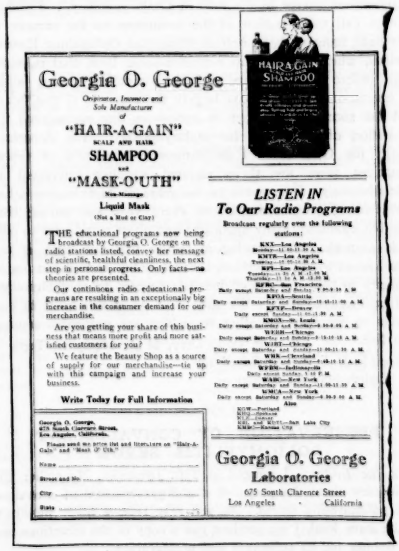
restore its youthful color, for the Bureau of Investigation has received scores of inquiries asking whether it will not do one or both of these things.

As Georgia O. George gives no hint as to the composition of Hair-A-Gain Scalp and Hair Shampoo, it seemed desirable to learn something about a product that enhances the "Beauty, Sheen, Lustre, Color, Texture," etc., etc., etc., of the scalp and hair. Specimens of Hair-A-Gain were purchased on the open market and turned over to the A. M. A. Chemical Laboratory with the request that it analyze the product. The chemists' report follows:

LABORATORY REPORT

"Original tins of Hair-A-Gain Scalp and Hair Shampoo paste (Georgia O. George Laboratories, 675 South Clarence Street, Los Angeles, California) and original bottles of Hair-A-Gain Liquid Shampoo were submitted to the A. M. A. Chemical Laboratory, by the Bureau of Investigation, for examination.

"*Hair-A-Gain Paste.*—This was a streaked, amber-colored paste, possessing a pungent, empyreumatic odor, resembling coal-tar. The mixture was alkaline to moist litmus paper. No statement as to the composition was found on the label.


Georgia O. George
Originator, Inventor and Sole Manufacturer of
"HAIR-A-GAIN"
SCALP AND HAIR
SHAMPOO
and
"MASK-O'UTH"
Non-Massage
Liquid Mask
(Not a Mud or Clay)
HAIR-A-GAIN SHAMPOO
THE educational programs now being broadcast by Georgia O. George on the radio stations listed, convey her message of scientific, healthful cleanliness, the next step in personal progress. Only facts—no theories are presented.
Our continuous radio educational programs are resulting in an exceptionally big increase in the consumer demand for our merchandise.
Are you getting your share of this business that means more profit and more satisfied customers for you?
We feature the Beauty Shop as a source of supply for our merchandise—tie up with this campaign and increase your business.
Write Today for Full Information
LISTEN IN
To Our Radio Programs
Broadcast regularly over the following stations:
KFI—Los Angeles
KMTR—Los Angeles
KPO—San Francisco
KFOA—Seattle
KFYR—Bismarck
KMOX—St. Louis
WEBH—Chicago
WJBT—Chicago
WMAQ—Chicago
WBBM—Chicago
WFBL—Syracuse
WMAK—Buffalo
WJAR—Providence
WEAN—Providence
KGW—Portland
KSL—Salt Lake City
KSD—Saint Louis
Georgia O. George
Laboratories
675 South Clarence Street
Los Angeles - California

Qualitative tests indicated the presence of iron (possibly obtained during comminution), sodium, a trace of potassium, combined fatty acids (such as oleic, palmitic, etc.), petroleum products, suggestive of a mixture of kerosene and liquid petrolatum, an animal fat resembling wool fat and a tar-oil (crude coal tar). Heavy metals (such as copper, lead, mercury and silver), alkaloids and tannin-like substances were not found. Glycerin and paraphenylenediamine, or similar acting coal-tar derivatives, were not identified. The sulphated ash was found to be 7.6 per cent. The total solids on evaporation on a steam-bath for sixteen hours amounted to 42.0 per cent; it consisted essentially of an alkaline semiplastic mass.

"From the analysis it appears that Hair-A-Gain Paste is essentially an alkaline pomade, consisting of a mixture of petroleum products, resembling kerosene and liquid petrolatum, containing among other things wool fat (probably hydrous wool fat—lanolin) and soap, to which has been added tar or a tar-like substance.

"*Hair-A-Gain Liquid Shampoo.*—The bottle contained 240 cc. (approximately 8 fluidounces) of a yellow, turbid, viscous liquid, possessing a faint odor suggestive of tar and a marked insoluble residue; the reaction of the mixture to moist litmus paper was alkaline. The specific gravity was found to be 1.0060 at 20° C. Qualitative tests indicated the presence of sodium, a trace of potassium and combined fatty acids (suggestive of oleic, palmitic, etc.). Heavy metals, carbonates, phosphates, alkaloids and oxidizing substances, such as perborates and peroxides, were not found. The sulphated ash was found to be 6.1 per cent. The total solids on evaporation on a steam-bath for sixteen hours amounted to 26.4 per cent; it consisted essentially of an alkaline and semisolid mass.

"From the results of the tests, it appears that Hair-A-Gain Liquid Shampoo is essentially a watery solution of ordinary soap."

Probably it is the tar, or tarlike substance, that is incorporated in the Hair-A-Gain Paste that has been responsible for such unpleasant effects as have been reported to THE JOURNAL following the use of the Hair-A-Gain Scalp and Hair Shampoo. A registered nurse from a Michigan hospital, in writing for information on Hair-A-Gain, stated: "It makes the head very, very sore and if any of the paste gets on to the forehead or any other clear skin, the surface dries and peels off as though burned. The scalp, too, peels off in large flakes." A woman who had used Hair-A-Gain wrote that the paste "appears to have too powerful a 'drawing' effect on the scalp when applied as directed."

As to the inferential claims that Hair-A-Gain will restore gray hair to its natural color or will grow hair on bald heads: These are quite impossibly untrue. Nevertheless, so long as Georgia O. George can carry her message to the public through the newspapers and over the radio, her business will flourish —a monument to human credulity and the persuasive powers of modern advertising.

Correspondence

ISOLATION OF SUPRARENAL CORTICAL HORMONE

To the Editor:—In an editorial on the hormone of the suprarenal cortex (THE JOURNAL, November 3, p. 1376) credit is given to Hartman and his associates for the successful isolation of this substance. The editorial omits to take notice of my publication (*Klin. Wchnschr.* **7**:1124 [June 10] 1928) in which the isolation of the hormone has been described already. I proposed "interrenin" as the name of this substance. The method of isolation which I used was extraction of the suprarenals with two-tenths normal hydrochloric acid and precipitation with sodium chloride. The alcoholic solution of the precipitate was reprecipitated several times until the active substance became protein free. The method published subsequently by Hartman in the September issue of the *American Journal of Physiology* is essentially the same as the one I had applied, which would suggest that his "cortin" is identical with "interrenin." My paper on interrenin had been submitted to THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION in January, 1928, but I failed to obtain its publication. I had reported the successful isolation of this hormone at the meeting of the New York Pathological Society, March 10, 1927. Another paper by myself and Dr. H. M. Greenwald appeared in the *American Journal of Diseases of Children* (**36**:324 [Aug.] 1928) reporting a case of acute suprarenal insufficiency which was successfully treated with the cortical hormone. I believe that these data suffice to establish my priority of the isolation of the suprarenal cortical hormone.

MAX A. GOLDZIEHER, M.D., Brooklyn.

[COMMENT.—The establishment of priority in scientific discovery not infrequently involves difficulties of decision and the diplomatic solution of delicate questions. There are familiar instances of the almost simultaneous announcement of important observations in which the circumstances clearly indicate that the different investigators involved had independently arrived at essentially the same goal. More than three fourths of a

century ago Claude Bernard, in Paris, and Viktor Hensen, in Kiel, isolated independently the substance that now bears the name of glycogen; nevertheless, only the name of Bernard is nowadays attached to the discovery. THE JOURNAL endeavors in its editorial comments to recognize priority of achievement and to accord proper appreciation to it. With the rapid growth of scientific contributions and the almost overwhelming accumulations of new publications in the field of the biologic sciences it would be little short of a miracle if errors of report did not find their way at times into our columns. In the editorial cited by our correspondent, reference was made to the success of Hartman and his associates in separating from the suprarenal cortex a potent substance to which the name "cortin" was assigned and which seems to function effectively in replacement therapy in the absence of the suprarenal glands. Hartman's paper was published in September, 1928 (*Am. J. Physiol.* **86**:353). The progress of such studies was, however, foretold in earlier publications mentioned in our editorial, as well as in Dr. Goldzieher's preliminary notice published last June in the *Klinische Wochenschrift*. The latter, following quite closely the procedures that Allen, Piper, Kimball and Murlin employed in the preparation of insulin from the pancreas, has isolated a protein-free substance from beef suprarenal glands. For this the name "interrenin" is proposed. The attempts at replacement therapy have given promising, though by no means entirely conclusive, results. The reported applications to clinical conditions are still too meager to deserve any final pronouncements. The relation between "cortin" and "interrenin" also remains to be demonstrated. Apparently, at any rate, an era of progress is being ushered in.—ED.]

THE USE OF OIL FOR THE DESTRUCTION OF MOSQUITO LARVAE AND PUPAE

To the Editor:—In L. O. Howard's little book on mosquitoes, published in 1901, he says:

> As long ago as 1812, the writer of a work published in London, entitled "Omniana or Horae Otiosiores," suggested that by pouring oil upon water the number of mosquitoes might be diminished. Delboeuf, in the *Revue scientifique*, in 1895, says that he used kerosene in this way fifty years before. H. E. Weed, in 1895, stated that in the French quarter of New Orleans it has been a common custom for many years to place kerosene in the water tanks to lessen the number of mosquitoes in a given locality. Suggestions as to the use of kerosene were made by Mrs. Aaron, and by Beutenmüller, in the Lamborn Prize Essays, "Dragon-Flies Versus Mosquitoes" (D. Appleton & Co., 1890) and in 1867 the present writer used kerosene in a watering trough at Ithaca, N. Y., and found that mosquito larvae were killed by it.

In a considerable number of easily available books dealing with malarial fever and yellow fever which have been examined, the authors seem satisfied to accept the fact that oil, and especially kerosene, placed on the surface of pools will destroy the larvae and pupae of the mosquitoes, without attempting to trace the suggestion to its source. Nor have I, indeed, attempted to do so. However, in running through the files of some old newspapers in pursuit of an entirely different subject, I came unexpectedly on the following note, signed A. B., published in the *American Advertiser*, Philadelphia, Aug. 29, 1793.

> As the late rain will produce a great increase of the mosquitoes in the city, distressing to the sick, and troublesome to those who are well, I imagine it will be agreeable to the citizens to know that the increase of those poisonous insects may be much diminished by a very simple and cheap mode which accident discovered—whoever will take the trouble to examine their rain-water tubs will find millions of the mosquitoes fishing about the water with great agility, in a state not quite prepared to emerge and fly off: Take up a wineglass full of the water and it will exhibit them very distinctly. Into this glass pour half a teaspoonful or less of any common oil, which will quickly diffuse over the surface, and by excluding the air will destroy the whole brood. Some will survive two or three days—but most of them sink to the bottom, or adhere to the oil on the surface in twenty-four hours. A gill of oil poured in a common rain-water cask will be sufficient: large cisterns may require more; and when the water is drawn off by a pump or by a cock the oil will remain undisturbed and last for a considerable time.
>
> Hickory ashes has been tried without effect.

It is interesting to recall that it was on Aug. 5, 1793, that the first cases of the most notable epidemic of yellow fever from which the city of Philadelphia ever suffered were observed.

It is inconceivable that the writer of this letter thought of the mosquitoes as in any way connected with the epidemic. He only thought of them as "distressing to the sick and troublesome to the well," as he states.

The same is no doubt true of Dr. Benjamin Rush, who, in his Account of the Bilious Remitting Fever as it appeared in Philadelphia in 1793, says on page 108, "Moschettos (the usual attendants of a sickly autumn) were uncommonly numerous." The idea of their being of etiologic significance is incompatible with his entire conception of the disease, its etiology and mode of transmission.

JOSEPH MCFARLAND, M.D., Philadelphia.
Professor of Pathology, University of Pennsylvania.

AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS

To the Editor:—In a communication (THE JOURNAL, November 24, p. 1654) regarding the American Board of Obstetrics and Gynecology, the writer says that "specialism is practically unsupervised except in the field of Otolaryngology." I should like to call the attention of the committee to the pioneer in this field, namely, the American Board for Ophthalmic Examinations, which has been in existence since 1916, that is, eight years before the corresponding board for otolaryngology began to function. I think it was largely the example of this board and the success which met its endeavors that encouraged the formation of the board for otolaryngology. The American Board for Ophthalmic Examinations is composed of representatives from the three national societies interested in ophthalmology. During the twelve years of its existence it has held two or three examinations every year and during that time has examined many applicants and given certificates to 688. It is somewhat discouraging to realize that our work is not even known to the profession, because it has been given ample publicity in both the special journals devoted to ophthalmology and in THE JOURNAL. We take it as an endorsement of our efforts to see that the other specialties are gradually coming into line.

E. C. ELLETT, M.D., Memphis, Tenn.
President, American Board for Ophthalmic Examinations.

PRESERVATION OF CONVALESCENT POLIOMYELITIS SERUM

To the Editor:—I noticed in THE JOURNAL, November 10, an inquiry about the preparation and preservation of convalescent poliomyelitis serum. As you may receive other inquiries of the same kind, I am sending you a copy of the directions we are issuing for its collection and preservation.

> In selecting convalescent donors for the preparation of serum, account is taken of their general physical condition, age and body weight. The amount of blood taken is determined by these factors. From healthy children of 13 to 16, the amount drawn varies between 300 and 500 cc. From adults 500 to 1,000 cc. may be taken if necessary, and in the case of professional donors this amount may be removed once in three weeks if their condition allows. It is customary to pay the professional donors $10 for 100 cc. drawn. Probably the more recent the attack of poliomyelitis, the more efficient will be the serum, though there is no definite opinion on this. There is evidence of the presence of immune bodies in serum from patients twenty years after the attack.
>
> In drawing the blood, the subject reclines with the head slightly elevated. After the antecubital region has been painted with iodine and washed with alcohol, a tourniquet is applied above the elbow and a 14 to 16 gage Luer needle is inserted into one of the superficial or deep veins. The needle is connected by sterile rubber tubing to a rubber-stoppered, sterile, 500 cc., wide-mouth centrifuge bottle. The air in the bottle is gently evacuated by means of a small hand suction pump connected by another piece of rubber tubing. The bottle should not be filled more than half full of blood, so that clotting may take place in a slanting position. After the bottle has been allowed to stand slantwise at room temperature for one-half hour, it is placed in the incubator for one hour at 37 C. and is then transferred to a refrigerator and allowed to remain for twenty-four hours. The more or less clear serum is drawn off in a suitable sterile bottle and the clot is separated from the sides of the bottle with a sterile glass rod, and returned to the refrigerator in an

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upright position. Within a few hours, additional serum may be poured off. This second lot will contain a great many red cells. Both lots are centrifugated to remove suspended red cells and then pooled. Then each lot is tested for sterility by placing 1 cc. of each batch of convalescent serum in 10 cc. of sterile bouillon. A mixture of tricresol, one part, and ether, two parts, is freshly prepared and added to the serum in such proportion that the serum will contain 0.3 per cent tricresol.

If it is not possible to obtain a recent Wassermann report on any donors used, a Wassermann test may be performed on the pooled serum from several individuals.

SIMON FLEXNER, M.D.,
The Rockefeller Institute for Medical Research.
New York.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

METHODS IN THE TREATMENT OF PSORIASIS

To the Editor:—A girl, aged 18, has seasonal attacks of psoriasis involving the entire covering of the anterior surface of the right tibia and the extensor surface of the right hand. What is the modern method of local treatment when chrysarobin and other reducing agents are used, as well as ultraviolet rays and autoblood?

THOMAS ST. CLAIR, M.D., Latrobe, Pa.

ANSWER.—There seem to be no specific methods for treating psoriasis, and all therapy is experimental in the individual case. In local patches of psoriasis chrysarobin may be used in the strength of from 5 to 10 per cent, either in ointment or incorporated with traumaticin (solution of gutta percha, N. F. IV). It may be applied once daily for about five days or until a moderate reaction appears, as indicated by redness. It should then be stopped and a soothing ointment used until the reaction has subsided, after which it may be used again if necessary. In people of dark complexion who tan, the actinic rays as obtained from the carbon arc lamp or others of that type may be of value in the treatment of psoriasis. Much of the improvement seems to depend on the pigmentation induced. Autoserum may also be valuable in some cases. The technic of its administration is to remove approximately 90 cc. (3 ounces) of blood from a vein at the bend of the elbow, keep it in a sterile container in the icebox for three or four hours, then decant the serum and centrifugate for fifteen or twenty minutes with a rapidly revolving centrifuge and then reinject from 25 to 30 cc. of the serum into the vein. The injections are repeated every five days. At the fifth injection a 2 per cent chrysarobin ointment is suggested for the continuation of the removal of the lesions.

COLLOIDOCLASIS?

To the Editor:—I have been urged to use intravenous injections of 1 cc. of saturated solution of magnesium sulphate and granulated sugar dissolved in 5 cc. of distilled water in cases of septicemia. Encouraging case reports were quoted in which this treatment was considered specific. I have hesitated to use it because of lack of knowledge of the action of magnesium sulphate and particularly of granulated sugar when administered intravenously. Have you any reports on the action of granulated sugar that would indicate its value if administered in this way for septicemia?

A. E. SACERIEN, M.D., Los Angeles.

ANSWER.—The most probable way in which intravenous injections of such hypertonic solutions might be of value in septicemia is by provoking a change in the colloidal condition of the blood (colloidoclasis), and in this manner inducing a foreign protein reaction.

PHYSICIANS IN THE GOVERNMENT SERVICE

To the Editor:—Kindly send me all the information you can as to the various branches of the government service that a physician can engage in, particularly as to entrance requirements, comparative salaries and the manner in which one would apply. As I am a married man with a family, I am interested in the comparative living conditions, marriage allowances and the branch of the service that would offer the best chance of advancement and home life. Finally, about how long would it take to obtain a position? I hold an honorable discharge from the army, am a member of the reserve officers corps and am physically fit.

HAROLD D. SEHL, M.D., Clark Mills, N. Y.

ANSWER.—There are more than 1,800 doctors of medicine in the United States Civil Service. They perform a wide variety of duties in the department of commerce, department of agriculture, department of the interior, department of labor, the Panama Canal, the treasury department, the veterans' bureau and miscellaneous bureaus.

The information requested is given fully in a thirty-seven page pamphlet (form 2092, March, 1928), published by the U. S. Civil Service Commission, Washington, D. C., which may be had on request to the commission. This pamphlet describes the nature of the work required, the salaries and the method of application for a position.

In addition to the civil service positions, there are a large number of doctors of medicine serving in the medical corps of the army and the navy and in the U. S. Public Health Service.

An inquiry addressed to the surgeon general's office, U. S. Army, Washington, D. C., or the surgeon general's office, U. S. Navy, Washington, D. C., or the U. S. Public Health Service, Washington, D. C., will bring forth the information desired concerning any one of those services.

INTERPRETATION OF VITAL STATISTICS

To the Editor:—This sample table on diphtheria gives the morbidity rate per hundred thousand of population in the U. S. registration area:

	White	Colored
Under 1 year	35	40
1-4 years	40	50
5-9 years	50	55

What is the total rate for each age group? I believe that it is 75, 90 and 105 per hundred thousand for each age group, but some maintain that it is 75, 90 and 105 for each 200,000 of population, or 37.5, 45 and 52.5 per hundred thousand.

ARTHUR J. REDLAND, M.D., Washington, D. C.

ANSWER.—The rates as calculated are incorrect. Rates cannot be combined by simple addition. In order to calculate the morbidity rate for the combined white and colored group, it is necessary to know the population in each age group for white and colored persons, respectively. If the number of white infants is known, the number of cases of diphtheria may be calculated from the morbidity rate. The number of cases among the colored infants can also be found in a similar manner. The number of cases among the white infants can then be added to the number of cases among the colored infants, giving the total for the combined group. Knowing the total combined population of infants, one may calculate the morbidity rates.

BOUILLON CUBES

To the Editor:—I have seen a patient who has been under the care of an osteopath for quite some time, and during this interval he has been on a diet of bouillon cubes. These beef cubes were highly recommended as containing a great deal of nourishment. I am, however, under the impression that their food value is almost nil and am seeking a definite answer from you as to their true food value. Please omit name.

M.D., Ohio.

ANSWER.—Bouillon cubes certainly do not contain a great deal of nourishment. A 4 ounce (120 cc.) portion of liquid bouillon contains approximately 2.5 Gm. of protein, and no fat or carbohydrate, and has a fuel value of 13 calories. The cubes represent a concentrated extract, so it is not difficult to see how little real food value they contain. In fact, their only relation to food lies in their possible stimulating effect on the gastric juices.

TREATMENT OF VAGINAL CONDYLOMA

To the Editor:—In a case I now have under observation a condyloma has developed at the vaginal outlet. The clitoris is about 1.5 cm. across and the right labia minor and the vagina are extensively involved. The trouble is of about two years' development and seems to have followed the establishment of a rectovaginal fistula (postoperative). The urethral opening is hidden by the growth, and the vagina is blocked so that a finger cannot be inserted. The Wassermann reaction is negative. Three examinations of tissue have been reported negative for malignancy. Six injections of antimony and potassium tartrate had no effect on the growth. The patient is 65 years of age. Rectal discharge makes it difficult to treat. I have used compound tincture of benzoin and silver nitrate and have tried to have the area kept clean, powdered and plugged with a loose fluff of gauze. Kindly suggest the best way of treating this woman. Please omit name.

M.D., Kentucky.

ANSWER.—The condylomatous growth is evidently due to persistent moisture. Keep the parts as dry as possible. Careful administration of roentgen rays, with treatment limited carefully to the confines of the growth, will probably help. Radium applications tend to produce ulceration.

Repair of the fistula is really the procedure of choice despite the patient's age, provided there is no contraindication to operation. If repair is impossible because of the condylomas, they will tend to disappear after temporary colostomy; colostomy would also insure healing after repair of the fistula.

ANATOXIN AND DIPHTHERIA TOXOID

To the Editor:—Can you give me some information concerning anatoxin as to its safety and efficacy as an immunizing agent against diphtheria, and whether it is obtainable in this country?

R. V. ZAKARKES, M.D., Philadelphia.

ANSWER.—Anatoxin is diphtheria toxin so modified by the addition of formaldehyde and the application of heat that the toxic properties are greatly reduced while the antigenic properties are retained. The product is prepared and recommended for use in diphtheria prophylaxis by Ramon of the Pasteur Institute, Paris, France.

American manufacturers supply a product, diphtheria toxoid, which is prepared by the addition of formaldehyde to diphtheria toxin and the application of heat (37 C.) until the toxicity is practically lost. This material is tested for antigenic efficiency by a guinea-pig protection test. It is essentially the same as anatoxin except for the method of testing for potency, anatoxin being submitted to the flocculation test in addition to the animal test which alone is required for toxoid.

The diphtheria toxoid of the H. K. Mulford Company and E. R. Squibb and Sons has been accepted for New and Non-official Remedies.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ALABAMA: Montgomery, Jan. 8-11, 1929. Sec., Miss Bessie Tucker, 519 Dexter Ave., Montgomery, Ala.

CALIFORNIA: Los Angeles, Feb. 4-7, 1929. Sec., Dr. Charles B. Pinkham, 420 State Office Building, Sacramento, Calif.

COLORADO: Denver, Jan. 8, 1929. Sec., Dr. Philip Work, 324 Metropolitan Bldg., Denver, Colo.

CONNECTICUT: Basic Science; *prerequisite* to examination for medical license; New Haven, February 9. Address State Board of Healing Arts, 1895 Yale Station, New Haven, Conn.

DISTRICT OF COLUMBIA: Washington, Jan. 8, 1929. Sec., Dr. Edgar F. Copeland, Suite 110, 1801 Eye St., Washington, D. C.

HAWAII: Honolulu, Jan. 14, 1929. Sec., Dr. James A. Morgan, Room 48, Young Bldg., Honolulu, Hawaii.

ILLINOIS: Chicago, Jan. 22-24, 1929. Supt. of Registration, Dr. V. C. Michels, Springfield, Ill.

MINNESOTA—Basic Science: Minneapolis, Jan. 2, 1929. Sec., Dr. E. T. Bell, 110 Anatomy Bldg., University of Minnesota, Minneapolis, Minn.

MINNESOTA: Minneapolis, Jan. 15-17, 1929. Sec., Dr. A. E. Comstock, 524 Lowry Bldg. St. Paul, Minn.

NEW YORK: Syracuse, Albany and Buffalo, Jan. 28-31, 1929. Chief, Mr. Herbert J. Hamilton, Department of Education, Educational Building, Albany, N. Y.

NORTH DAKOTA: Grand Forks, Jan. 1, 1929. Sec., Dr. G. M. Williamson, Grand Forks, N. D.

OREGON: Portland, Jan. 2-4, 1929. Sec., Dr. Joseph F. Wood, 510 Selling Bldg., Portland, Ore.

PENNSYLVANIA: Harrisburg, Jan. 8-12, 1929. Director, Dr. C. D. Koch, Board of Medical Education and Licensure, Harrisburg, Pa.

RHODE ISLAND: Providence, Jan. 3-4, 1929. Sec., Dr. B. U. Richards, State House, Providence, R. I.

SOUTH DAKOTA: Pierre, Jan. 15, 1929. Director, Dr. H. R. Kenaston, Bonesteel, S. D.

WASHINGTON: Basic Science: Olympia, Jan. 10, 1929. Director, Mr. Charles Maybury, Department of Licenses, Olympia, Wash.

WASHINGTON: Olympia, Jan. 14, 1929, Director, Mr. Charles Maybury, Department of Licenses, Olympia, Wash.

WISCONSIN: Madison, Jan. 8-10, 1929. Sec., Dr. Robert E. Flynn, 315 State Bank Bldg., La Crosse, Wis.

Illinois June Examinations

Mr. V. C. Michels, superintendent of registration of the Illinois Department of Registration and Education, reports the written and practical examination held at Chicago, June 26-29, 1928. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Of the 154 candidates examined, 142 passed and 12 failed. Twenty-four physicians were licensed by reciprocity with other states, and six by endorsement of credentials. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
Howard University of Medicine	(1886) 79, (1927) 79, 84		
Chicago Medical School	(1927) 78, 83, (1928) 75, 75, 76, 77, 79, 80, 80, 81, 82, 82, 83, 83, 83, 86		
Loyola Univ. School of Med.	(1927) 79, (1928) 75, 75, 77, 77, 78, 79, 79, 79, 79, 80, 81, 81, 81, 81, 81, 82, 83, 83, 83		
Northwestern University Medical School	(1927) (1928) 77, 77, 77, 78, 79, 79, 80, 80, 80, 81, 81, 81, 82, 82, 82, 82, 83, 83, 83, 83, 84, 84, 84, 84, 84, 85, 87, 88		79,
Rush Medical College	(1927) (1928) 80, 81, 81, 81, 83, 83, 83, 83, 83, 83, 83, 84, 84, 84, 84, 85, 85, 85, 86, 87, 88, 89, 89, 89		87,
University of Illinois College of Med.	(1928) 75, 75, 76, 78, 79, 79, 79, 79, 79, 80, 80, 80, 81, 81, 81, 81, 82, 82, 82, 82, 83, 83, 83, 83, 83, 84, 84, 84, 84, 86, 86, 89		79,
Indiana University School of Medicine	(1927) 85, (1928)		78
Harvard University Medical School	(1926) 80, (1927)		82
St. Louis University School of Medicine	(1927)		79, 79
Washington University School of Medicine	(1927) 79,		80, 83
University and Bellevue Hospital Medical College	(1922)		83
University of Pennsylvania School of Medicine	(1917)		82
Baylor University College of Medicine	(1927)		81
University of Virginia Department of Medicine	(1925)		81
Marquette University School of Medicine	(1928)		76, 86
Dalhousie University of Medicine	(1927)		75
University of Toronto Faculty of Medicine	(1907)		81
University of Berlin	(1924)		75

College	FAILED	Year Grad.	Reciprocity with
Chicago Medical College	(1922) 69, (1926) 72, (1927) 67, *, (1928)*		
Loyola University School of Medicine	(1928)*		
St. Louis University School of Medicine	(1927)		80
Miami Medical College	(1903)		70
University of Vienna	(1922)†		75
University of Kiel	(1923)		68
National University, Athens	(1923)		57
University of Naples	(1916)†		55

* No grade given.
† Verification of graduation in process.

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists	(1927)		California
Illinois Medical College	(1904)		Iowa
University of Illinois College of Medicine	(1925)		California
State Univ. of Iowa C. of M.	(1909), (1917), (1925), (1925)		Iowa
Johns Hopkins University School of Med.	(1915), (1925)		Maryland
Harvard University Medical School	(1922)		Maine
Univ. of Michigan Medical School	(1921), (1925), (1925)		Michigan
University of Minnesota Medical School	(1926)		Minnesota
St. Louis University School of Medicine	(1922)		Missouri
Washington University School of Medicine	(1924), (1926)		Missouri
Creighton University of Medicine	(1915)		Nebraska
University of Nebraska College of Medicine	(1910)		Nebraska
Ohio State University College of Medicine	(1927), (1927)		Ohio
University of Pennsylvania School of Medicine	(1907)		Penna.
Wisconsin College of Physicians and Surgeons	(1912)		Missouri
Dalhousie University Faculty of Medicine	(1926)		California

College	ENDORSEMENT OF CREDENTIALS	Year Grad.	Endorsement from
Northwestern University Medical School	(1928)		U. S. Navy
Rush Medical College	(1926), (1927)		N. B. M. Ex.
Rush Medical College	(1927), (1927)		U. S. Navy
Johns Hopkins University School of Medicine	(1924)		N. B. M. Ex.

Missouri July Examinations

Dr. James Stewart, secretary of the Board of Health of Missouri, reports the written examination held at St. Louis, July 17-19, 1928. The examination covered 14 subjects and included 112 questions. An average of 75 per cent was required to pass. There were 88 candidates examined, all of whom passed. The following colleges were represented:

College	PASSED	Year Grad.	Number Licensed
Howard University School of Medicine	(1927)		1
Rush Medical College	(1927)		1
Northwestern University Medical School	(1928)		2
University of Illinois College of Medicine	(1928)		3
Indiana University School of Medicine	(1928)		1
Johns Hopkins University School of Medicine	(1926)		1
Washington Univ. School of Med.	(1926) 1, (1927) 5, (1928)	18	24
Central Medical College of St. Joseph	(1897)		1
St. Louis University School of Medicine	(1927) 2, (1928)	46	48
Creighton University School of Medicine	(1927)		1
University of Tennessee College of Medicine	(1928)		1
Meharry Medical College	(1927)		2
Marquette University of Medicine	(1928)		1
McGill University Faculty of Medicine	(1921)		1

District of Columbia October Examination

Dr. Edgar P. Copeland, secretary of the board of medical supervisors, reports the oral and written examination held at Washington, Oct. 9-11, 1928. The examination covered 16 subjects and included 80 questions. An average of 75 per cent was required to pass. There were 29 candidates examined and all passed. Two physicians were licensed by reciprocity with other states. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
College of Medical Evangelists	(1928)		89
George Washington University Medical School	(1927) (1928) 83.7, 85.2, 86.5, 89, 90, 91.2, 91.5, 91.8		80.6,
Georgetown University School of Med.	(1928) 80.5, 83.2, 83.6,		85.6
Howard University School of Medicine	(1927) (1928) 77.8, 81.3, 81.5, 82.2, 82.3, 83.3, 85.2, 89.2, 89.3		84.7,
Johns Hopkins University School of Medicine	(1926)		88.8
Washington University School of Medicine	(1926) 88, (1927)		89.1
University of Oregon Medical School	(1925)		81.3
University of Virginia Department of Medicine	(1926)		85.2

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Jefferson Medical College of Pennsylvania	(1916)		Penna.
University of Buffalo School of Medicine	(1900)		New York

Book Notices

DIE BEHANDLUNG DER AUGENKRANKHEITEN IN DER ALLGEMEINPRAXIS. Von Dr. Kurt Steindorff. Paper. Price, 5.80 marks. Pp. 124, with 18 illustrations. Leipzig: Georg Thieme, 1928.

In this small tome, an attempt is made to tell the general practitioner how to treat such diseases of the eye as may come under his care, on the supposition that he can diagnose the condition. The medicaments used in ophthalmology are described and the methods of their use are elaborated. The different diseases of the eye are mentioned briefly, and the therapeutic measures indicated in each are given at some length. Much space is devoted to the general treatment of syphilis and tuberculosis, a phase of medical practice in which the ophthalmologist should be taking instruction from the general practitioner and not giving it. But in telling the tale of iritis, the author missed the great opportunity of the book. He speaks of rheumatic and gouty iritis, syphilitic and tuberculous iritis, gonorrheal, traumatic and sympathetic iritis, but refrains carefully from any references to iritis due to focal infection. Above all, he fails to mention the close cooperative work between ophthalmologist and general practitioner so necessary in revealing the etiologic factors in any case of iritis.

A TEXT-BOOK OF SURGERY FOR STUDENTS AND PHYSICIANS. By W. Wayne Babcock, A.M., M.D., F.A.C.S., Professor of Surgery and of Clinical Surgery in the Temple University. Cloth. Price, $10 net. Pp. 1367, with 1055 illustrations. Philadelphia: W. B. Saunders Company, 1928.

The industry and scholarship involved in the task of presenting the entire subject of surgery in a volume this size must command one's respect and admiration. In the arrangement of the subject matter, the author follows much the same scheme as has been followed in the past. Part I, on general surgery, includes chapters on such topics as inflammations and repair, wounds, hemorrhage, hemostasis, transfusion, thrombosis and embolism. Part II, on the surgery of systems, takes up the subject of bones, joints, blood vessels and the ductless glands. Part III is devoted to surgical technic, including, in a broader sense, surgical therapy, anesthesia, and preoperative and postoperative treatment. Part IV, concerned with regional surgery, takes up more than half the volume, covering the subject in its entirety. The subject matter is always abreast of current events in diagnosis and treatment. The brevity and the clarity of the descriptive matter suggest a thorough mastery of the subject coupled with literary skill.

TRUDI ODESSKAVO GOSUDARSTVENAVO DERMATO-VENEROLOGICHESKOVO INSTITUTA IMENI E. S. GLAWTSCHE. YUBILEINII SBORNIK, 1919-1927. Tom Pervii. Paper. Pp. 558. Odessa, 1927.

The first volume of the Glawtsche State Dermatovenerologic Institute of Odessa is a festschrift commemorating the work done from 1917 to 1927 and in honor of Egor Stepanowitsch Glawtsche, who founded the institute and who at one time was an assistant to Professor Pospelow. The institute was the outcome of the work of Glawtsche and was taken over by the state ten years ago. Glawtsche died, Aug. 17, 1919. The book is in Russian, and with the Russian letters even the names are unintelligible to the ordinary reader. Fortunately, an abstract in German appears at the end of each article. The work covers a wide range of subjects in dermatology, syphilis and the other venereal diseases in both their social and their economic aspects. The chief interest is in the evidence it shows of present activities in medicine in Russia. It is testimony of the eagerness with which physicians under the soviet government are working to advance science. The institute is organized into the usual departments and is in the hands of trained men. It is conducted by the People's Commissary for Health of the Soviet Government.

RECENT ADVANCES IN SURGERY. By W. Heneage Ogilvie, M.A., M.D., M.Ch., Assistant Surgeon, Guy's Hospital. Cloth. Price, $3.50. Pp. 461, with 108 illustrations. Philadelphia: P. Blakiston's Son & Company, 1928.

Since it is always a good practice to take an inventory of the progress of one's art, this rather modest volume deserves attention. The author limits himself principally, though not entirely, to the advances made in England and in America. Because of limitation of space and multiplicity of subjects he adopts a selective method, avoids much that is known, and points out the more recent ideas and practices. The best written chapter is that on neurosurgery. It contains a discussion of the circulation of the cerebrospinal fluid, of hydrocephalus, of recent work on the pathology of tumors of the central nervous system, and of newer diagnostic methods, such as examinations of cerebrospinal fluid, cisternal puncture, ventriculography and pneumomyelography. Other chapters give the impression of being somewhat inadequate, perhaps because of space limitation.

DIE ERNÄHRUNG DES DIABETIKERS. Von Prof. Dr. Clemens Pirquet, Vorstand der Universitäts-Kinderklinik in Wien, und Doz. Dr. Richard Wagner, Assistent der Universitäts-Kinderklinik in Wien. Kochbuch von Oberschwester Hedwig Birkner, Lehrschwester Katharina Freisteiner, und Lehrschwester Maria Jakubeck. Cloth. Price, 18 marks. Pp. 191, with tables. Berlin: Urban & Schwarzenberg, 1928.

A radical departure from the usual method for computing diabetic diets is presented here. The reason given is that it obviates the difficulties involved in either the percentage method (grams of carbohydrate, protein and fat per hundred grams of food) or the method of equivalent portions (as developed by von Noorden). The final result, however, is far from simple; or else the conception of simplicity is vastly different in Germany than it is in the United States. The basis of the new method is the nem system of Pirquet. The total caloric requirement is derived from the square of the sitting height and is expressed in hektonems (100 nems). Tables are given for all the ordinary foods, presenting not only the usual percentage and caloric values but also the proportion of protein, fat and carbohydrate calories in relation to the total caloric value, the nem value per gram of food, the weight of a hektonem and the mellitogenic power of the food expressed as dekanems (10 nems) of dextrose per hektonem of food. The figures are rounded off to cut out decimal figures for approximate estimation. This system is further elaborated into diets based on an arbitrary protein level of 10 per cent of the total calories, and varying mellitogenic values, protein and fat, however, not being considered as dextrose-producing foods. Diets are divided into six classes for determination of tolerance, maintenance, fattening, starvation, starch and variation. Some bread is allowed in most of the diets. In general, these diets represent the usual German system of management. More than half the book is devoted to recipes, carefully classified according to protein and mellitogenic content, adapted chiefly to the German dietary and appetite, and containing many preparations that are usually absolutely forbidden by American diabetic manuals. A great deal of thought and effort must have been expended in compiling the data in this book, presumably for the purpose of making diabetic management easier and more rational both for the physician and for the intelligent layman. Actually, however, a great deal of confusion has probably been introduced into the subject and it is doubtful whether a real contribution has been made. Certainly, for the American physician or diabetic patient, this volume is entirely unsuitable.

DIAGNOSTISCHE UND THERAPEUTISCHE IRRTÜMER UND DEREN VERHÜTUNG: CHIRURGIE. Herausgegeben von Prof. Dr. J. Schwalbe. Geh. San.-Rat in Berlin. Heft 9: Zwerchfell, innere Hernien, Darmkanal (ausgenommen Duodenum, Appendizitis und Darmverschluss). Von Prof. Dr. E. Heller, Leitender Arzt der chirurgischen Abteilung der Krankenhauses St. Georg zu Leipzig. Magen, Duodenum. Von Prof. Dr. J. Hohlbaum, Oberarzt an der chirurgischen Universitätsklinik zu Leipzig. Darmverschluss. Von Prof. Dr. O. Kleinschmidt, Direktor der chirurgischen Abteilung des Städtischen Krankenhauses zu Wiesbaden. Paper. Price, 24 marks. Pp. 347, with 140 illustrations. Leipzig: Georg Thieme, 1928.

This is the ninth and last volume to be published on diagnostic and therapeutic errors and their avoidance in surgery. It deals with the diaphragm, stomach and duodenum, and with ileus. To indicate how this work is replete with practical points, one might mention, for example, the instructions for the prevention of the fatal diaphragm spasm in tetany by the intramuscular injection of magnesium sulphate, with the alternative in extreme cases of paralyzing the phrenic nerve and performing artificial respiration. In hiccup, blocking of the phrenic nerve by procaine is advised, with freezing of this nerve in the most obstinate cases. The conservatism with which operative indications are discussed is shown by the advice not to operate for the relief of possible operative adhesions, unless coprostasis and retention of flatus cause marked disturbance of nutrition and comfort. In connection with the discussion of

hemorrhoids, the practice is urged of examining every patient with rectal bleeding for carcinoma and the warning made not to underestimate chronic though slight loss of blood. The author advises that, after operation for hemorrhoids, the feces be kept fluid by means of oil and liquid petrolatum, by enemas and by salines, as the large and hard stools resulting from the retention for four or six days of fecal matter after the administration of opium are liable to injure the healing wound areas. These examples may suffice to indicate the value of this work and to make the English speaking physician regret that it is at present available only in the German language. While its translation into Spanish, Italian and Russian is in progress, announcement has not yet been made regarding its translation into English.

DICTIONARY OF AMERICAN MEDICAL BIOGRAPHY. Lives of Eminent Physicians of the United States and Canada, from the Earliest Times. By Howard A. Kelly, M.D., LL.D., and Walter L. Burrage, A.M., M.D. [Revised, re-edited, rewritten.] Cloth. Price, $12. Pp. 1364. New York: D. Appleton & Company, 1928.

Previous editions of this work have appeared under the auspices of other publishers, under the title "American Medical Biographies." The last previous edition was published in 1920. The present edition contains 2,049 sketches, of which about 300 are new. Some of those in previous editions have been deleted to make space for the new material. The volume has been in the past, and will continue to be in the future, one of the most valuable reference works available in the history of medicine.

INCOMPATIBILITY IN PRESCRIPTIONS. By Santosh Kumar Mukherji, M.B., Editor, Indian Medical Record. Paper. Price, Re. 1-8. Pp. 135. Calcutta: Rai Saheb B. N. Mukherji & Son, 1928.

This small but quite ample book is intended chiefly for medical students to cure them of their fear of writing prescriptions, which a thorough study of the book would be well calculated to do. A hasty survey, however, would be more apt to increase the fear.

SURGICAL DIAGNOSIS IN TABULAR OUTLINE FOR STUDENTS AND PHYSICIANS. By Dr. A. J. Cemach. Translated by Edward L. Bortz, M.D., Associate in Medicine, The Lankenau Hospital, Philadelphia. Introductory note by John B. Deaver, M.D. Cloth. Price, $12 net. 109 tabular forms and 129 plates, with 548 subjects. Philadelphia: F. A. Davis Company, 1928.

This is intended as a reference textbook. It gives in tabular form the diagnosis and differential diagnosis of practically every surgical condition. In spite of the questionable value of treating surgical subjects in synopsis or in tabular form, this book is remarkably well organized. The value of the work is much enhanced by the numerous artistic illustrations and by many excellent roentgenograms. This is the best feature of the book. The English translation is very satisfactory.

MODERN X-RAY TECHNIC. By Ed. C. Jerman. Cloth. Price, $5.50. Pp. 260, with illustrations. St. Paul: Bruce Publishing Company, 1928.

This deals primarily with the important technical points in roentgenographic and roentgenoscopic work. The book fills a much needed place in providing the information necessary for the instruction of lay technicians in the field of roentgen work under the close supervision of the roentgenologist. The work is clear and concise and at the same time covers the field in considerable detail. The chapters on the stereoscope and distortion detail contrast and radiographic density warrant special mention. These might profitably be read and studied by roentgenologists as they contain much valuable information that can be put into practice in the successful operation of a roentgen department. Familiarity with their contents will go a long way toward making technical work more uniform, and better films will follow. It is important for the roentgenologist and also for the technician in charge to know and to be able to impart to assistants what a film lacks and how to improve it. These chapters are pregnant with just such facts. The questions and answers at the completion of each chapter are also a commendable feature. The chapter on positions deserves mention. Photographs of the part being examined with the resultant roentgenogram on the same page are of great value. The technician is shown what can be obtained if the position at the time of the roentgen examination is correct. The chief unfavorable criticism of the book is the slightly commercialistic point of view of some of the chapters.

Books Received

Books received are acknowledged in this column, and such acknowledgment must be regarded as a sufficient return for the courtesy of the sender. Selections will be made for more extensive review in the interests of our readers and as space permits. Books listed in this department are not available for lending. Any information concerning them will be supplied on request.

RECIENTES ADQUISICIONES EN MEDICINA, TERAPÉUTICAS, CLÍNICAS Y DE LABORATORIO. Por los Doctores G. E. Beaumont, médico de los Hospitales Middlesex de Londres, y E. C. Dodds, professor de quimica biológica de la Universidad de Londres. Traducción de la cuarta edición inglesa por el Doctor José Die y Más. Fourth edition. Cloth. Pp. 451, with 48 illustrations. Madrid: Javier Morata, 1928.

Badly printed translation of recently published English work on advances in medicine.

VERBRECHEN ALS SCHICKSAL. Studien an kriminellen Zwillingen. Von Professor Dr. Johannes Lange, Oberarzt am Krankenhause München-Schwabing und Abteilungsleiter an der Deutschen Forschungsanstalt für Psychiatrie (Kaiser-Wilhelm-Institut) in München. Paper. Price, 7 marks. Pp. 96, with 5 illustrations. Leipzig: Georg Thieme, 1929.

Studies of crime among twins.

DIE KLINISCHE BEDEUTUNG DER QUALITATIVEN VERÄNDERUNGEN DER LEUKOZYTEN. Von Priv.-Doz. Dr. Walther Gloor, Oberarzt der medizinischen Universitätsklinik, Zürich. Mit einem Vorwort von Prof. Dr. O. Naegeli. Paper. Price, 12 marks. Pp. 89, with illustrations. Leipzig: Georg Thieme, 1929.

Monographic consideration of qualitative analyses of leukocytes.

LEHRBUCH DER BLUTKRANKHEITEN. Für Ärzte und Studierende. Von Prof. Dr. Hans Hirschfeld, Abteilungsleiter am Universitätsinstitut für Krebsforschung an der Charité in Berlin. Second edition. Paper. Price, 22 marks. Pp. 263, with illustrations. Leipzig: Johann Ambrosius Barth, 1928.

New edition of standard German consideration of diseases of the blood.

LA VIDA, EL SEXO Y LA HERENCIA. Por Juan José Barcia Goyanes, catedrático de anatomia descriptiva y embriologia en la Facultad de medicina de la Universidad de Salamanca. Paper. Pp. 233, with 20 illustrations. Madrid: Javier Morata, 1928.

Poorly printed monograph on heredity and genetics.

LE NEFROSI. Por Dott. Alessandro Esposito, assistente nella Clinica Medica Generale della R. Università di Pavia. Con prefazione del Prof. Adolfo Ferrata. Paper. Price, 40 lire. Pp. 212. Milan: S. A. Istituto Editoriale Scientifico, 1929.

Italian contribution on kidney disease.

SÍFILIS CONTROLABLE. Por Dr. S. Quesada, graduado de la Facultad de Medicina de la Habana. Prólogo del Dr. J. S. Covisa, professor de dermatologia de la Facultad de medicina de Madrid. Paper. Pp. 270. Madrid: Javier Morata, 1928.

Miserably printed discussion of control of syphilis.

HANDBUCH DER SOZIALEN HYGIENE UND GESUNDHEITSFÜRSORGE. Herausgegeben von A. Gottstein, A. Schlossmann, und L. Teleky. Band VI: Krankenhaus-, Rettungs-, Bäderwesen. Sozialhygienische Bedeutung der Sozialversicherung. Berufsberatung Gesundheit und Wirtschaft. Von F. Appelius, E. Aschenheim, E. Dietrich, usw., usw. Paper. Price, 48 marks. Pp. 600, with 70 illustrations. Berlin: Julius Springer, 1927.

EPIDEMIOLOGIE UND TROPENKRANKHEITEN IN CHINA. Von Dr. Ernst G. Nauck. Band XXXII. Beiheft 5. Beihefte zum Archiv für Schiffs- und Tropen-Hygiene Pathologie und Therapie exotischer Krankheiten. Paper. Price, 5 marks. Pp. 83. Leipzig: Johann Ambrosius Barth, 1928.

EMPLOYMENT FLUCTUATIONS IN PENNSYLVANIA 1921 TO 1927. By J. Frederic Dewhurst. Special Bulletin, number 24. Paper. Pp. 192, with illustrations. Harrisburg: Commonwealth of Pennsylvania, Bureau of Publications, 1928.

ON THE STATE OF THE PUBLIC HEALTH. Annual Report of the Chief Medical Officer of the Ministry of Health for the Year 1927. Paper. Price, 2s. 6d. net. Pp. 271. London: His Majesty's Stationery Office, 1928.

FORTY-SECOND REPORT (50TH YEAR) OF THE STATE DEPARTMENT OF HEALTH FOR THE YEAR ENDING JUNE 30, 1927. State of Connecticut Public Document No. 25. Paper. Pp. 346, with illustrations. Hartford, 1927.

INFECCIONES OCULARES. Bacteriologia, patologia y terapéutica. Por M. Guijarro Carrasco, professor agregado del Instituto Oftálmico Nacional. Cloth. Pp. 199, with illustrations. Madrid: Javier Morata, 1928.

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Medicolegal

Streptococcus Infection and Accident Insurance

(Moore v. Fidelity & Casualty Co. of New York (Calif.), 265, P. 207)

This is an action by the plaintiff, as beneficiary, on an accident insurance policy issued to her daughter by the defendant insurer. The policy insured against "bodily injury sustained through accidental means and resulting in disability, dismemberment, loss of sight, or death." It provided that "blood poisoning resulting directly from a bodily injury shall be deemed to be included in said term 'bodily injury.'" The occupation of the insured was stated in the policy as being that of a private nurse. On Feb. 4, 1922, while engaged in attending a patient suffering from an infection with *Streptococcus hemolyticus*, the insured contracted the disease, through "flying streptococcic germs," from which she shortly thereafter died. The plaintiff, as beneficiary, recovered a judgment on the policy and the insurance company appealed.

The supreme court of California pointed out that it may be assumed that the insurer intended to insure the nurse against the occupational risks of her profession and was fully aware of the hazards of her particular calling. The only limitation placed by the policy on the liability of the insurer arising out of these occupational hazards was that the injuries should be "bodily injuries" and that they should be sustained "through accidental means." The term "bodily injuries," must be interpreted, the court said, in the light of the occupation of the insured; and the term "accidental means" must be interpreted in the light of the occupation and of the peculiar risks or hazards which are the incidents of its exercise, and in the light of the safeguards with which modern science has surrounded the care of the sick in hospitals through the use of the expert skill and precautionary knowledge of physicians and nurses.

With respect to the term "bodily injuries" as employed in the policy, its meaning was clarified, the court said, by the further provision appearing in the policy that "blood poisoning resulting from a bodily injury shall be deemed to be included in said term." Even in the absence of this clarifying provision, the court was of the opinion that there could be little doubt that infection caused by contact with the germs of a communicable disease constitutes a "bodily injury" within the usual meaning of that term as it is employed in compensation acts and insurance policies. The court cited, as in point, the cases of *San Francisco* v. *Industrial Accident Commission*, 183 Calif. 273, 191 P. 26, holding that influenza contracted by a hospital steward from patients in the course of his employment was a bodily injury, and *Horton* v. *Travelers' etc., Co.*, 45 Calif. App. 462, 187 P. 1070, holding that streptococcic germs introduced into the mouth of a patient by means of polluted dental instruments, causing blood poisoning, was a bodily injury within the meaning of that term as used in an accident insurance policy similar to that involved in this case. In a number of cases, the court pointed out, it has been held that typhoid germs introduced into the system through the drinking of polluted water constituted a bodily injury within the meaning generally of accident insurance policies. Whether bodily injury that disintegrates the human system is caused by flying germs or by flying shrapnel or by a poisoned arrow or by the sting of an insect is only a matter of degree as to the size or quality of the instrumentality inflicting the injury.

The term "accidental means" depends for its application on the facts of each particular case. Thus, the court argued, while the result of the exposure of the ordinary or unsafeguarded individual to the infection of a virulent, communicable disorder would have, as its expected consequence, infection and contraction of the disorder, such would not be the case with respect to the experienced and safeguarded physician or nurse in a modern hospital. Were the rule of interpretation of this clause in accident policies that insisted on by the appellants, the court said, the result would inevitably be that physicians, hospital attendants, and nurses would be beyond the pale of protection under the terms of accident policies such as in this case.

In a dissenting opinion, it was objected that the effect of the majority opinion would be that a disease-bearing germ inhaled by any one while in a public conveyance, on a public street, in a place of public amusement, in his own home, or in any place where human beings are in close enough contact to be within the zone of contagion and unaccompanied by any abrasion or trauma or physical interposition is a bodily injury; that, in such case, the accident policy is converted into one of health insurance if the insured survives and life insurance in case of death; and that if such had been the law during the influenza epidemic following the World War, the accident insurance companies would not have survived. The policy did not insure against accidental death but against death through accidental means. In such provisions, according to the minority views, the cases say that "a differentiation is made between the result and the means which is the operative cause in producing this result. It is not enough that death or injury be unforeseen, but there must be some element of unexpectedness in the preceding occurrence which leads to injury or death." In this case the means were neither unusual nor unexpected. While the result may be said to have been unexpected, that was far from saying that the means were unexpected or unusual.

The majority opinion, of course, prevailed and the judgment of the lower court was affirmed.

Industrial Commission Disregards Testimony of Eight Physicians

(Employers' Mut. Ins. Co., et al. v. Industrial Commission of Colorado, et al. (Colo.), 265 P. 99)

This case arose under the workmen's compensation act of Colorado. The claimant suffered an injury to his hip, Nov. 13, 1924, while in the course of his employment. A hearing was held before a referee, May 6, 1925, and the claimant was awarded four weeks' total disability and 10 per cent permanent disability, it appearing that much of the disability was due to a previous accident and to a hernia. Later, August 10, the industrial commission reopened the case on its own motion to determine the permanent disability of the claimant. On December 16, after several hearings, the commission entered an award finding the claimant still disabled as a result of the accident and awarded compensation of $5 a week during disability. June 8, 1926, the commission ordered further hearings and the claimant testified that he was still unable to work. The superintendent of the Colorado General Hospital testified that nothing whatever could be found on the most minute examination that would account for the exaggerated soreness complained of by the claimant and that he thought the symptoms were either hysterical or pretended. At another hearing a neurologist testified that he could not find any cause for the pain complained of; that it was either imaginary or feigned; that the fracture suffered by the claimant could not cause the pain; that he could go back to work if he so desired. Other experts testified to like effect. The claimant testified that he was subject to great pain, loss of appetite and inability to work, and that he was obliged to use crutches. The physician for the claimant testified that the accident had caused a permanent neuritis of the main nerve of the leg; that this might never heal; that there was a depression at the point of the injury which could be seen by the naked eye; that it might result in atrophy, and that the claimant was totally and perhaps permanently disabled. On the evidence the referee found that the symptoms were hysterical and awarded compensation at the rate of $10 a week from Nov. 24, 1924, to May 20, 1926, for temporary total disability, and thereafter at the rate of 10 per cent permanent disability according to the referee's first award. Compensation was paid in full and receipts were filed with the commission. No petition for a review was filed.

The commission, May 18, 1927, on its own motion caused another hearing in this case. At this hearing, evidence was introduced that since the last hearing the claimant had been examined by four experts, not one of whom was called as a witness; that he was still obliged to use crutches; that in January, 1927, an operation was performed on the claimant's right leg and some bone removed. One expert testified that he had examined the claimant again and found him unable to work because of permanent injuries. July 7, 1927, the commission entered a supplemental award in which it found that the claimant was permanently and totally disabled as a result of the accident and that he should be awarded compensation for such disability, dating from Oct. 24, 1924. An appeal was

entered to this last award by the employer and the insurance company, on the contention that the commission had acted without power in entering the award of July 7, 1927, by reason of the fact that the award of Aug. 19, 1926, had become final and had been paid in full. The supreme court of Colorado held that the statutory provision providing that, if no petition for a review is filed, the referee's award shall be the final award of the commission, does not preclude the commission from review of the award on its own motion. The supreme court further said that the case presented a remarkable state of facts. Eight physicians testified that the claimant could return to work and one testified that he was permanently disabled. There were observations of three referees who examined the witnesses, and awards were made on their reports, the last of which was paid in full. The commission did not see or examine witnesses and yet it reversed the findings of its referees and decided the case on the testimony of one physician against the testimony of eight. And yet, the court said, since there was the evidence of one physician and of the claimant himself, direct and positive, on which the commission might base its final award, the court could not consider the evidence to the contrary and could not hold that the evidence was so weak that it amounted to no evidence. The judgment of the district court, affirming the award of the industrial commission, was therefore affirmed.

Compensation for Loss of Remaining Eye

(Bartlett Hayward Co. et al. v. Industrial Accident Commission et al. (Calif.), 265 P. 195)

In 1922 the employee in this case suffered an injury arising out of and in the course of his employment, which caused the loss of his remaining eye. The sight of his other eye had been previously destroyed. In 1923, he filed an application for compensation under the workmen's compensation act of California and the industrial commission made an award for a 25 per cent permanent disability. In December, 1926, the supreme court of California, in the case of *Liptak* v. *Industrial Accident Commission*, 200 Calif. 39, 251 P. 635, decided that when an employee had lost the sight of his remaining eye in an industrial accident he was entitled to a rating of permanent total disability. On the strength of the holding in the Liptak case, the employee in this case filed a petition asking the commission to amend its findings in his case and allow him a rating of permanent total disability. The industrial commission entertained the petition, amended its former findings, and granted the requested rating. The employer and the insurer applied for a rehearing, claiming that the first award had finally adjudicated the rights of the parties and that there was not shown any new or further disability that would give the commission the power to increase the award. The application for a rehearing was denied and an appeal was taken to the supreme court of California.

The supreme court pointed out that if the commission had the power to reopen the case and to amend its award, such power was derived from section 20 (d) of the workmen's compensation act, which provided in part as follows:

> The commission shall have continuing jurisdiction over all its orders, decisions, and awards . . . and may . . . rescind, alter or amend any such order, decision or award upon good cause appearing therefor . . . upon the grounds that the disability of the person in whose favor such award was made has either recurred, increased, diminished or terminated. . . .

In construing this provision the supreme court said that the continuing jurisdiction of the commission was not limited to the consideration of changes in the physical condition of the workman, but extended to the right to rescind, alter or amend the orders, decisions or awards on good cause appearing therefor. What constitutes "good cause," the court said, depends on the circumstances of each case. The term is relative. The court said that it may be assumed that the determination of the commission as to what constituted "good cause," while entitled to great weight, would not be conclusive. Certainly, the court thought, so far as the facts in the present case were concerned, the mistake or inadvertence of the commission in giving the injured workman a rating of 25 per cent, when he was entitled to a rating of 100 per cent, permanent disability would constitute "good cause" for the exercise of continuing jurisdiction of the commission. In fact, the court thought, the demands of justice would require that the compensation be so increased under the circumstances. The court also pointed out that a general survey of the workmen's compensation laws in the several states disclosed that the idea of continuing jurisdiction had been put into almost universal practice. The vesting of power in the commission to change its awards on account of the changed conditions of the injured employee is a common statutory provision, and the placing within the discretion of the commission the power to modify awards on equitable grounds is not uncommon. The award of the commission was therefore affirmed.

Evidence of Death from Nitrous Oxide Anesthesia

(Updegraff v. Gage-Hall Clinic et al. (Kan.), 264 P. 1078)

This action was brought by the plaintiff to recover damages for the death of her husband, alleged to have occurred during an operation through the negligent administration of an anesthetic. The judgment of the district court was against the plaintiff and she appealed to the supreme court of Kansas.

The plaintiff's husband was seriously injured in his arm and was taken to the defendant's office. The surgeon who attended the patient found that the flexor and extensor muscles had been severed, that the ulnar vein had been cut, and that a clot had been organized between the outer edges of the severed muscles and the vein. The patient was removed to a hospital for operation and an anesthetist called to assist. Prior to the administration of the nitrous oxide gas, both the anesthetist and the surgeon examined the patient's heart by placing their ears to his chest. The anesthetist also examined the pulse. During the operation, the patient's pulse rate was never lower than 84 or higher than 95. The respiration was between 20 and 24 and there was no unusual cyanosis of the patient. At the conclusion of the operation the patient was breathing normally, when the anesthetist noticed a sudden failure of respiration. He could not find the pulse in front of the ear or in the neck. No heart sounds could be heard by the surgeon. All efforts to revive the patient failed. Mucus bubbled from the mouth of the patient and continued to do so for several minutes. The plaintiff contended that a proper preoperative examination of the patient was not made, but the supreme court held that there was no evidence of any unusual condition of the patient nor that a preexamination would have disclosed any contraindication of nitrous oxide at or before the time of the giving of the anesthetic or that any test other than was given would have disclosed anything to have made the giving of the anesthetic improper. Several specialists in anesthesia testified that, from the facts in the case, the death was due to an embolism, not from the anesthetic, basing their testimony on the sudden cessation of the respiration and the cardiac action, the simultaneous arrest of both functions, and the frothy material that emerged from the mouth of the patient. Mucus in the mouth is not characteristic, they testified, of nitrous oxide asphyxiation. The supreme court held that the evidence showed that the patient undoubtedly died from an embolism.

Objection was made by the plaintiff to a hypothetical question propounded by the defendants to several expert witnesses during the trial, on the ground that it invaded the province of the jury. The supreme court said that the question propounded the query of whether or not certain specified treatments of the patient by the physicians would constitute skilful and proper practice in that or similar communities. The question was a proper one, the court held, and quoted from *James* v. *Grigsby*, 114 Kansas 627, 220 P. 267:

> What is the proper treatment to be used in a particular case is a medical question to be testified to by physicians as expert witnesses; laymen, even jurors and courts, are not permitted to say what is the proper treatment for a disease or how a specific surgical operation should be handled.

The judgment of the lower court was affirmed.

Society Proceedings

COMING MEETINGS

District of Columbia, Medical Society of, Washington, January 2. Dr. C. B. Conklin, 1718 M Street, N. W., Washington, Secretary.
Society of American Bacteriologists, Richmond, Va., December 27-29. Dr. James M. Sherman, Cornell University, Ithaca, N. Y., Secretary.

Current Medical Literature

AMERICAN

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American Journal of Syphilis, St. Louis

12: 445-602 (Oct.) 1928

*Prolonged Treatment in Neurosyphilis. H. C. Solomon and A. Berk, Boston.—p. 445.
Prognostic and Therapeutic Value of Intradermal Injections of Nonspecific Proteins in Syphilis: Analysis, Criticism, Case Reports and Conclusions on Work of Drs. Dujardin and Decamps of Belgium. H. Gougerot, Paris.—p. 487.
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*Results from Use of Bismarsen in Tabes Dorsalis. N. Tobias, St. Louis.—p. 536.
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Prolonged Treatment in Neurosyphilis.—Solomon and Berk believe that with the methods now available for the treatment of neurosyphilis, namely, iodides, mercury, bismuth, arsphenamine, intraspinal, intracisternal, intraventricular, tryparsamide and fever, many favorable results both clinical and serologic are obtainable. In some cases years of treatment may be required and in some cases more than one method may be needed to secure improvement. It is still to be learned which is the most effective treatment or combination of treatments. For the vast majority of patients tryparsamide and the fevers seem the most potent therapeutically, but in many cases, if not most, both may be advisable, and it may be advantageous to support them with one or several of the other drugs or procedures. Most patients do not seem to develop any intolerance to tryparsamide, but can receive it week after week uninterruptedly for two or more years. Febrile treatment may precede or be used subsequently to the other forms of treatment.

Use of Bismarsen in Tabes Dorsalis.—Bismarsen is a water-soluble compound of bismuth and arsphenamine, readily absorbed by the intramuscular route, relatively free of accumulative effects and simple of administration. The arsenic content varies from 12 to 15 per cent and the bismuth from 23 to 25 per cent. The drug is usually administered in doses of 0.2 Gm., and dissolved in 1 cc. of distilled water containing 2 drops of a 2 per cent butyn solution. Care must be taken that the drug is dissolved completely before being injected. With the usual antiseptic precautions, the solution is injected slowly into the upper quadrant of the buttock, preferably in the inner angle. If a vein is entered, the needle must be withdrawn and another site used. By vigorously massaging the site of injection after the administration of the drug for one minute by the watch, pain can be reduced to a minimum. Of twenty patients treated with this drug, only one developed an abscess and in this case the abscess was traceable to faulty technic. In no case were systemic reactions observed. No cases of dermatitis exfoliativa developed. One patient with a marked pyorrhea developed a bismuth line on the gums after the tenth injection. The action of the drug on the kidneys is negligible. Beneficial results were noted on the average about two weeks after the bismarsen treatment had been begun. In all the cases, the lightning pains were favorably influenced, the ataxias to a lesser extent. There did not seem to be any effect on optic atrophy. The effect of the drug on the blood Wassermann reaction appears to be more marked than on the spinal fluid Wassermann reaction.

Annals of Internal Medicine, Ann Arbor, Mich.

2: 401-501 (Nov.) 1928

*Angina Pectoris. M. H. Kahn and J. Barsky, New York.—p. 401.
*Congenital Atresia of Aortic Ring. N. Philpott, Chicago.—p. 422.
Krysolgan in Treatment of Lupus Erythematosus: Twenty-Eight Cases. W. H. Goeckerman, Rochester, Minn.—p. 428.
Physician's Dental Education. W. J. Stone, Pasadena, Calif.—p. 435.
Hypothyroidism. L. M. Warfield, Milwaukee.—p. 446.
Causes of Flatulence. A. S. Welch, Kansas City, Mo.—p. 456.
Diagnosis and Treatment of Anemias. W. W. Duke, Kansas City, Mo.—p. 463.
Liver Diet in Pernicious Anemia. H. Berglund, Minneapolis.—p. 471.
Scientific Spirit. M. ten Hoor, New Orleans.—p. 474.

Angina Pectoris.—Almost 22 per cent of the 200 patients studied by Kahn and Barsky had their first typical attacks before the age of 40. Rheumatism and diabetes appear as important factors in the etiology. Arteriosclerotic disease is the outstanding condition in angina pectoris, as indicated by the tortuous peripheral and retinal vessels, the presence of pericorneal arcus, and arteriosclerotic renal changes. There does not seem to be any direct etiologic relation between the arterial blood pressure and the production of angina pectoris. The most commonly found physical sign in angina pectoris was a rough systolic murmur due to aortic change. Angina pectoris was associated with rheumatic mitral stenosis in six cases. Of particular prognostic significance are the associated clinical symptoms of cardiac asthma, pulsus alternans, systolic gallop rhythm, and the occurrence of cyanosis on exertion or with an attack. The differential diagnosis of angina pectoris from gallbladder disease is discussed. The electrocardiographic picture in angina pectoris is analyzed in detail. Thirty patients died from angina pectoris. In these the age of onset bore a distinct relationship to the duration of life—the later the onset, the worse the prognosis. Palliative and surgical measures in the treatment have proved of considerable value in selected cases. A classification of angina pectoris is presented conceived on an organic basis.

Congenital Atresia of Aortic Ring.—Philpott reports on a patient with aortic and mitral atresia who survived for sixty-two hours. Cyanosis and dyspnea were the prominent clinical features. There was no definite evidence of an inflammatory process and the defect was probably due to arrest of development in fetal life.

Archives of Pathology, Chicago

6: 773-946 (Nov.) 1928

Immunologic Reactions in Tissue Cultures: I. Effect of Tuberculin O. T. on Normal Leukocytes in Vitro. G. Shwartzman, New York.—p. 773.
Id.: II. Analysis of Effect of Tuberculin O. T. on Morphology of Normal Leukocytes in Vitro. G. Shwartzman, New York.—p. 790.
*Penetration of Heart by Aluminum Pipestem. W. C. Hunter, R. R. Staub and W. B. Lunsford, Portland, Ore.—p. 807.
*Lesions in Animals Inoculated with Streptococcus Cardioarthritidis. W. P. Belk, F. J. Jodzis and E. Fendrick, Philadelphia.—p. 812.
*Histogenesis of Essential Lipoid Histiocytosis (Niemann-Pick's Disease). W. Bloom, Chicago.—p.827.
*Effects of Amniotic Fluid on Serous Surfaces. S. Warren, Boston.—p. 860.
*Fenestra of Diaphragm. H. R. Fishback, Chicago.—p. 867.
Differentiation of Schistosoma Hematobium and Schistosoma Mansoni According to Position of Spine. A. Plaut, New York, and H. Vogel, Hamburg, Germany.—p. 871.
Alleged Mechanism of Local Nerves in Causation and in Treatment of Edema Caused by Irritants. M. L. Tainter and F. L. Reichert, San Francisco.—p. 872.
Citric Acid Metabolism: Effect of Citric Acid and Citrates on Quantitative Determinations of Acetone Body Content by Van Slyke Method. B. E. Clarke and G. H. Hansmann, Iowa City.—p. 881.
Recent Literature on Tropical Sprue. C. Weiss, San Juan, P. R.—p. 885.

Penetration of Heart by Aluminum Pipestem.—Hunter et al. report the case of a man who, while in a depressed phase of manic-depressive psychosis, plunged the aluminum tube of his pipestem through the left wall of the chest, completing the ingress of the tube by pressure on it with the rubber mouthpiece. When seen a short time after the accident, the patient was in good physical condition, and the only evidence to support this story was the presence of three small wounds in the skin at the level of the sixth left interspace in the nipple line. There was no bleeding from the wounds and no evidence of internal hemorrhage. Because the nature of the foreign body was known, a roentgen study was not made at this time. The patient was kept at home for two days following the accident. About twenty-four hours after the attempted suicide, he was walking about the house. During the first two days, the temperature did not rise above 99 F., and the pulse and the respiratory rates were not increased. Physical signs referable to the heart and lungs were absent. A friction rub was heard for the first time over the precordial region on the fifth day, but other adventitious sounds were not heard. A roentgen examination of the chest failed to reveal the presence of a foreign body. The lack of evidence of a foreign body, together with the continued good condition of the patient, led the attending physicians to doubt that the tube was actually present in the chest. On the sixth day, the temperature was 102.4 F., with a corresponding rise in the pulse rate. On the eighth day, the temperature rose to 103.4 F., the pulse rate to 122 and the respiration rate to 42 per minute. The fever was at all times continuous and not of the septic type. At 2 a. m. on the day of death, and eight days after the accident occurred, the patient suddenly became cyanotic, with rapid pulse and respirations. This lasted for approximately an hour and was followed by improvement. Twelve hours later, the same symptoms returned, and the patient sank rapidly and died after a period of ten minutes. When the chest was opened, a small, ragged wound was found in the intercostal muscles between the fifth and sixth ribs on the left side. In the anterior surface of the parietal pericardium near the apex of the heart was a small wound which had been sealed off with fibrin. The inner surface of the pericardium at this point showed a pitlike depression with the base directed outward. The parietal pericardium was everywhere thickened, and infiltrated with blackish, clotted blood. The pericardial sac was obliterated by an exudate, chiefly fibrinous, but with a considerable admixture of clotted blood over the anterior surface of the heart. The heart was moderately increased in size. Two centimeters from the apex of the left ventricle anteriorly and slightly to the left of the anterior interventricular branch of the left coronary artery, an aluminum tube projected outward from the surface of the heart for a distance of nearly 2 cm. into the pericardial sac. The visible end of the tube was blunt. A section across the ventricles of the heart showed the tube passing through the anterior wall of the left ventricle just to the left of the interventricular septum and the base of the anterior papillary muscle of the mitral valve, and tearing through the trabeculae carneae and entering the ventricular cavity at the apex. At this point, there was a small, fibrinous thrombus between two trabeculae carneae. The tube then passed through the posterior wall of the ventricle, taking a course slightly to the left from the point of entrance anteriorly, through the pericardial sac and the parietal pericardium, and entered the medial surface of the left lung. The aluminum tube measured 8.9 cm. in length and 4 mm. in diameter. The end which had penetrated the heart was shaped like a trocar and was fairly sharp in spite of the tip having been bent backward over the beveled surface. Toward the sharpened end the tube was coated by an adherent, blackish, gummy substance, apparently nicotine. The lumen of the tube was plugged with clotted blood.

Experimental Rheumatic Fever.—In rabbits and horses inoculated with *Streptococcus cardioarthritidis*, lesions were identified by Belk et al. which resembled those of rheumatic fever. These lesions were described.

Essential Lipoid Histiocytes.—The distribution and the appearance of the foam cells characteristic of Niemann-Pick's disease (essential lipoid histiocytosis) are described in detail by Bloom. The reactive connective tissue of the body responds in this disease by mobilization, hypertrophy and accumulation of large amounts of lipoids. The various epithelial, muscle, ganglion and cartilage cells (all of which are functionally specifically differentiated cells) respond by lipoidal degeneration. The connective tissue foam cells develop from the local histiocytes, as well as from the embryonic mesenchymal cells of Maximow. The blood agranulocytes develop intravascularly into foam cells. The fibroblasts and the peripheral capillary endothelial cells do not turn into lipoid-storing macrophages.

Prevention of Adhesions: Use of Amniotic Fluid.—Aiming to prevent postoperative peritoneal adhesions, Warren performed experiments on animals with concentrated bovine amniotic fluid, prepared by fractional alcoholic precipitation. It was found that amniotic fluid may be used with safety in the animal or human peritoneum, and it reduces the number and extent of adhesions formed. Amniotic fluid does not interfere with normal healing. It apparently acts by reducing oozing from injured surfaces, thereby lessening the amount of fibrin formed, and also, since it is but slowly absorbed, by lubricating the peritoneal cavity, until the danger of adhesions being formed is past. Amniotic fluid may be utilized to prevent the formation of adhesions in serous cavities other than the peritoneum; the amniotic concentrate is safe, more convenient, and very nearly as efficacious as whole amniotic fluid.

Fenestra of Diaphragm.—The pathologic condition of the diaphragm described by Fishback as a fenestra is different from the usual diaphragmatic hernia. The name applied was selected as an anatomic term descriptive of this pathologic entity. Pain in the back was the outstanding symptom. The only significant point in the history was a normal first childbirth eighteen days before the onset of the present pain. Severe, knifelike pains began suddenly in the lower lumbar region on both sides, radiating upward between the shoulder blades. Accompanying these were intermittent cramping pains in the lower part of the abdomen, like uterine contraction pains. The intense lumbar pain continued until relieved by morphine, and never disappeared entirely. Nausea persisted more or less continuously, with occasional slight vomiting. The bowels and kidneys were regular in function. Death occurred suddenly. Autopsy disclosed an oval opening in the left dome of the diaphragm 11 cm. in long diameter. The long axis of this opening extended from the dome backward and laterally, none of the structures which normally perforate the diaphragm was found within the opening. Its edges were smooth, rounded and fibrous, without evidence of any fresh tear of tissue. Through the opening extended the ascending and descending colon and the duodenum with their mesenteric attachments, and the splenic attachment. When the breast-plate was removed, the stomach wall bulged forward under considerable pressure. The lungs and mediastinal structures were compressed and pushed over entirely to the right side of the chest. The heart was not only displaced bodily, but was rotated to the right on its long axis, so that the usual posterior surface of the left ventricle presented itself anteriorly. The stomach was greatly dilated with fluid and gas. It lay

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with the pyloric end in the upper part of the chest and the esophageal end below, with a sharp bend of the gastro-esophageal junction. Also compressed together in the left and central portions of the chest were the greatly dilated transverse colon, the omentum, a portion of the duodenum, and the spleen and the pancreas. After puncture and drainage of the hollow viscera, all the displaced abdominal structures could be returned through the diaphragmatic fenestra to their normal sites, except the omentum. This was found firmly attached by fibrous adhesions to the anterior basal aspect of the left lung for a distance of 4 cm. This diaphragmatic opening was considered a dilatation of a true fenestra, and not a recent rupture of a normal or a herniated diaphragm.

California and Western Medicine, San Francisco

29: 289-360 (Nov.) 1928

Chronic Cystic Mastitis: Relation to Cancer of Breast. A. R. Kilgore, San Francisco.—p. 289.
Full-Time Professorship in Medical Education. P. E. Rothman, Los Angeles.—p. 293.
*Pyelography: Errors in Technic and Interpretation. M. B. Wesson, San Francisco.—p. 297.
Intestinal Protozoa: Relation to Certain Diseases. J. V. Barrow, Los Angeles.—p. 303.
*Surgical Operations in Pulmonary Tuberculosis. W. H. Thearle, Denver.—p. 309.
*Organization Needs of Western Industrial Hygiene. W. P. Shepard, San Francisco.—p. 314.
Abdominal Food Allergy. A. H. Rowe, Oakland.—p. 317.
*Phrenicotomy and Thoracoplasty: Treatment of Multiple Suppurative Bronchiectasis. A. C. Callister, Salt Lake City.—p. 323.
*Hyperpyrexia with Recovery. H. M. F. Behneman, San Francisco.—p. 327.
Training of Anesthetists in Great Britain. C. Malone, San Francisco.—p. 331.
Bacillus Dysenteriae: California Strain. J. Lommel, San Francisco.—p. 332.
Lure of Medical History: Malpighi and Leeuwenhoek. W. Dock, San Francisco.—p. 333.
Late Posttyphoid Abscess: Case. C. H. Arnold, San Francisco.—p. 335.
Isolated Tuberculosis of Carpus: Case. M. C. Mensor, San Francisco.—p. 336.
Fluoroscopic Examination of Paranasal Sinuses. R. A. Powers, Palo Alto.—p. 338.
Perforating Eye Injuries of Young Children: Three Cases. F. H. Rodin, San Francisco.—p. 338.

Pyelography: Errors in Diagnosis.—Six cases are reported by Wesson: (*a*) diverticula of the bladder with reflux to left pyonephrosis; (*b*) hydronephrosis of the right kidney due apparently to an aberrant artery, in which passage of catheters caused anuria of the normal left kidney; (*c*) bilateral renal lithiasis, with a small stone in the uninfected, nonfunctioning kidney, and staghorn in the infected, functioning kidney; (*d*) overinjection with 24-inch gravity pressure, the solution spraying out through or between the tubules; (*e*) congenital bilateral ptosis of kidney, in which a unilateral pyelogram resulted in nephropexy and four years later the kidney had resumed approximately its former position, and (*f*) calcified hematoma, symptomless until the picture was seen by the neurotic individual.

Surgical Operations in Pulmonary Tuberculosis.—Thearle's figures in a series of 142 patients operated on since the fall of 1921 are 35 per cent cured and 31 per cent improved, with a mortality or 14.8 per cent. The operative mortality in early suitable cases is 3.8 per cent. Early mortality due to shock per se or pulmonary hemorrhage is relatively rare; the most frequent cause is cardiac failure from mediastinal flutter superimposed on an existent myocarditis. This flutter occurs in patients with little pleural thickening and slight or no mediastinal fixation in direct proportion to the width and number of ribs removed at an operation, and its occurrence in varying degrees in a one-stage thoracoplasty has been the factor that has been responsible for the adoption of the two or more stage procedures now in vogue. Next in frequency toward the end of the first week is aspiration or tuberculous pneumonia (usually the bronchopneumonic type), and occasionally wound infections. Later deaths within the first three months, as well as the late mortality months after operation, are mostly due to tuberculous reactivations and extensions in the lungs, less often from the disease elsewhere in the body. Results so far obtained by thoracoplasty from a study of statistics show, roughly, one third of the patients cured and an equal number improved.

Organization Needs of Western Industrial Hygiene.—Some of the shortcomings of industrial hygiene development in the West, as seen by Shepard, consist of lack of standardization, failure to profit from the successes and mistakes of others in similar lines, failure to pool successful experience for the benefit of mutual support, failure to teach their full value to all western industries, and a tendency to isolate themselves from the public health program of their communities. The chief reason for these shortcomings seems to be the rapid growth of the entire industrial field in the West and the lack of organization among western industrial hygienists. The formation of industrial hygiene societies either as branches of the county medical societies, or as branches of the western division of the American Public Health Association is proposed.

Phrenicotomy and Thoracoplasty for Suppurative Bronchiectasis.—Callister is convinced that chronic suppurative bronchiectasis should be treated by surgical measures. This is particularly true when repeated bronchoscopic aspirations do not afford permanent relief. Extensive lesions of this sort can be treated best by extrapleural compression. This treatment is probably safer when it consists of phrenic nerve extirpation, followed by posterior thoracoplasty, which should be complete for the side affected.

Hyperpyrexia with Recovery.—The temperature in Behneman's case reached 110.6 F. It was at this height at least one hour and decreased rapidly when the fall once started. There is no doubt of the authenticity of the reading. It was checked by a number of persons. Readings were by mouth, as the patient was not irrational or stuporous enough to prevent this procedure. The patient complained comparatively little during the whole night and remembered only a commotion about his fever, and that several thermometers were put in his mouth. The subjective and objective improvement for two weeks immediately following this hyperpyrexia was remarkable. From a man who was completely covered, except on the head, with weeping, ulcerative, open lesions of mycosis fungoides, he soon changed to one who had nodular, dried-up scabs in their place. Undoubtedly the cause for this hyperpyrexia was toxin liberated by bacterial growth; secondary infection was present in many of the lesions. Behneman believes that the cause of the post-pyretic improvement was the protective mechanism of fever. Most bacteria are killed at a temperature slightly above that of the body. There was also the possibility of a copious formation of immune bodies which did their part in antagonizing the agent of infection.

Florida M. Association Journal, Jacksonville

15: 227-270 (Nov.) 1928

Scleroderma with Report and Presentation of Patient with Generalized Type of Disease. J. M. Anderson, Lake Wales.—p. 241.
Gas Anesthesia. W. E. Van Landingham, West Palm Beach.—p. 243.
Bronchoscopy as Aid in Diagnosing and Treating Intratrachial and Bronchial Conditions. G. E. Chandler, Miami.—p. 246.
Diseases of Heart. W. C. Box, Graceville.—p. 248.
Lamed Bowel. L. L. Andrews, Orlando.—p. 250.
Trench Mouth. J. W. Mitchell, Sebring.—p. 251.
Impacted Ureteral Calculus: Case. E. S. Gilmer, Tampa.—p. 253.
Treatment with Roentgen Ray of Uterine Fibroids Associated with Hemorrhage. A. C. Ives, Tampa.—p. 254.
Double Pregnancy: One in Utero and One in Right Tube. T. M. McDuffee, Manatee.—p. 255.
Normal Relations of Psychiatry to General Practice of Medicine and Surgery. G. H. Benton, Coral Gables.—p. 256.

Indiana State M. Association Journal, Fort Wayne

21: 469-508 (Nov.) 1928

Laboratory as Aid in Pulmonary Tuberculosis. W. H. Ordway, Mount McGregor, New York.—p. 469.
Exophthalmic and Adenomatous Goiter. W. D. Little, Indianapolis.—p. 477.
Electrosurgery. E. N. Kime, Indianapolis.—p. 480.
*Health Work in Public Schools. O. B. Nesbit and M. Smythe, Gary.—p. 483.

Health Work in Gary, Ind., Public Schools.—The health work carried on in the public schools at Gary, Ind., is described by Nesbit and Smythe. In this department there are two physicians, eight teachers of health and hygiene (nurses), four clerks, two dentists, three hygienists, one sight-saving teacher, and one oral deaf teacher. The budget for 1927-1928 was

$24,279.53, or $1.45 per pupil, 32 cents below the average of $1.74 for cities of its size having inspection in the United States. The physicians, half the nurses, and the dentists work forty-eight weeks—forty weeks of the regular school year and eight weeks of the summer school period. When a school reaches an enrolment of 2,000 pupils, a nurse is assigned to that building and an office is provided. The nurse is on hand the week before the opening of school in the fall to meet the parents and new pupils who are being enrolled at that time. She explains the working of the department. A record is made of the name, address, place and date of birth, nationality, and history of past illnesses of the new pupils. The nurse talks about tests and immunization, and about smallpox vaccination. She advises revaccination at least every five years to test immunity. The nurse then weighs the child, tests its vision, looks at its hair and, if she finds nits or pediculosis, instructs the mother in the proper treatment. In the initial inspection last year of 13,171 grade pupils, 146 such cases were found. In one school in 1919-1920 there was a pediculosis case rate of 9.8, with a loss of 40.5 days per thousand pupils; this has been steadily reduced to 1.6 cases and a loss of 1.3 days per thousand pupils in 1927-1928. In this school five years out of ten have shown no cases, and no time lost on account of impetigo. If the young child has a strabismus or marked eye defect, the mother is asked to return for a conference with the school physician or to visit the family physician or an ophthalmologist.

Journal of Bacteriology, Baltimore

16: 287-386 (Nov.) 1928

*Effect of Pure Soaps on Bactericidal Properties of Phenolic Germicides. B. Hampil, Baltimore.—p. 287.

Study of Micrococcus Zymogenes. M. Frobisher, Jr., and E. R. Denny, Baltimore.—p. 301.

Physiologic Studies of Cellulose Fermentation. J. R. Sanborn, Montreal. —p. 315.

Inhibiting Effect of Streptococcus Lactis on Lactobacillus Bulgaricus. L. A. Rogers, Washington, D. C.—p. 321.

Single Cell Technic: Presentation of Pipet Method as Routine Laboratory Procedure. A. H. Gee and G. A. Hunt, New Haven, Conn.—p. 327.

Rennin Action: I. Rennin Production by Bacillus Prodigiosus. J. G. Wahlin, Lawrence, Kan.—p. 355.

Id.: II. Effect of Rennin on Sodium Caseinate. J. G. Wahlin, Lawrence, Kan.—p. 375.

Effect of Soap on Phenol Germicides.—The results of experiments made by Hampil indicate the impossibility of producing a germicidal soap by adding small quantities of a phenolic compound to soap. The addition of large quantities of a phenolic disinfectant is not feasible, since the cost of production precludes the use of any but very crude and irritating phenols. Phenols are therefore unsuitable as disinfectant agents in the production of germicidal soaps. The germicidal activity of a phenolic compound is interfered with more extensively by the disperse phase than by the gel phase of soaps. Several theories to explain the inhibitive action of soaps on the bactericidal activity of phenols are discussed. Evidence is introduced to show that the soap removes the phenolic substance from the solution and thereby interferes with its bactericidal activity, since this activity is dependent on the solution of the phenol in water.

Journal of Infectious Diseases, Chicago

43: 363-474 (Nov.) 1928

Production of Histamine, Tyramine, Bronchospastic and Arteriospastic Substances in Blood Broth by Pure Cultures of Micro-Organisms. K. K. Koessler, M. T. Hanke and M. S. Sheppard, Chicago.—p. 363.

Metabolism of Leishmania Tropica. A. J. Salle and C. L. A. Schmidt, Berkeley, Calif.—p. 378.

*Intranasal Inoculations of Rabbits with Bacillus Influenza. J. E. Walker, Baltimore.—p. 385.

*Micro-Organisms of Lung Abscess and Bronchiectasis. L. H. Ermatinger, St. Louis.—p. 391.

*Absence of Infectivity in Filtered Urine from Diabetic Patients. G. H. Ettinger and G. B. Reed, Kingston, Ont.—p. 399.

Action of Bacteriophage on Psychrophilic Organisms. A. L. Elder and F. W. Tanner, Urbana, Ill.—p. 403.

Mucosus Organism from Suppurative Lesions of Rat on Diet Deficient in Vitamin A. W. L. Bradford, Rochester, N. Y.—p. 407.

Biologic and Serologic Studies of Streptococcus Cardioarthritidis. W. A. Kreidler, Philadelphia.—p. 415.

Approximation of Toxicity of Diphtheria Toxin in Vitro. A. Locke and E. R. Main, Chicago.—p. 420.

Etiology of Dermatitis of Experimental Pellagra in Rats. W. D. Salmon, I. M. Hays and N. B. Guerrant, Auburn, Ala.—p. 426.

Snuffles in Rabbits. F. R. van de Carr and K. J. Kilgariff, Berkeley, Calif.—p. 442.

Sensitization and Immunization with Bacteriophage in Experimental Plague. A. Compton, Alexandria Municipality, Egypt.—p. 448.

Proteus Hemolysin. J. F. Norton, E. Verder and C. Ridgway, Chicago. —p. 458.

Thermophilic Bacteria in Canned Foods. M. Shaw, Madison, Wis.—p. 461.

Experimental Influenza.—Following the intranasal inoculation of rabbits with a recently isolated strain of Pfeiffer's bacillus, Walker recovered the organism from the nasal cavities of the animals for periods of from four to fifteen days. Two animals so inoculated showed a nasal discharge at the time when the organisms were most numerous. The inoculation was followed by the appearance of agglutinins in the blood stream. Animals once infected were immune to reinjection. After two months' cultivation, the strain lost its ability to attack the nasal mucous membrane of rabbits. Two other strains of Pfeiffer's bacillus were tested and were found to be unable to produce infection. Failure to produce disease with Pfeiffer's bacillus is demonstrated experimentally to be due either to immunity of the host as a result of previous infection or to lack of virulence on the part of the organism. The fluctuations in the virulence of the organism and in the resistance of the host fit in well with what would be expected of the etiologic agent of epidemic influenza. These facts, together with the now well substantiated ability of the organism to produce primary respiratory disease of the cold-influenza type, are believed to relate Pfeiffer's bacillus to the etiology of epidemic influenza more closely than ever.

Bacteriology of Lung Abscess and Bronchiectasis.—Bacteriologic examinations made by Ermatinger in thirty-three cases of chronic and acute lung abscess and bronchiectasis disclosed the pyogenic organism *Staphylococcus aureus* in 75.40 per cent of the total number of cases, hemolytic streptococci in 55.30 per cent and pneumococci in 19.40 per cent. A spirochete, apparently falling into the *Leptospira* group, according to Noguchi's classification, was obtained from the case reported and was kept alive, in a mixed culture containing bacteria, for a period of fourteen days.

Noninfectivity of Diabetic Urine.—Fresh urine from diabetic patients, filtered (Berkefeld) and injected into fourteen rabbits and seven dogs, did not cause any appreciable change in the blood sugar percentage over periods of from fifty-five to 236 days. Aerobic and anaerobic cultures showed similar negative results during periods up to sixty-three days. Small amounts of reducing substances were found occasionally in the urine of some of the rabbits, but not in excess of the amounts found in the control animals, and there was never any suggestion of interference with carbohydrate metabolism. The urine was obtained from eight diabetic patients, ranging in age from 12 to 55 years and with histories of diabetes from three weeks to fifteen months. It may be assumed that if the urine of a diabetic patient contains a causal organism it would be present within this period. The conclusion reached by Ettinger and Reed is that the filtered urine of a diabetic patient does not contain any organism which can reproduce the diabetic condition in dogs or rabbits.

Medical Journal and Record, New York

128: 493-552 (Nov. 21) 1928

Politics vs. Medicine. E. H. Williams, Los Angeles.—p. 493.

Careful Case Recording in Education of Physician. C. L. Minor, Asheville, N. C.—p. 495.

Blood Sugar: Blood Urea Relationship: Analysis of 10,368 Synchronous Sugar-Urea Determinations. H. J. John, Cleveland.—p. 498.

Chronic Fatigue Intoxication: Definite Clinical Entity. M. Golob, New York.—p. 503.

Bacterial Factor in Rheumatic Infection in Childhood. C. F. Coombs, Bristol, England.—p. 506.

Profound Anemia Due to Ulcerated Internal Hemorrhoids: Three Cases. J. F. Saphir, New York.—p. 508.

Aftertreatment of Fractures. S. W. Boorstein, New York.—p. 510.

Health Examinations as Means of Diagnosis in Cancer Control. F. A. Faught, Philadelphia.—p. 515.

Radium Treatment of Malignancy: Cases. W. S. Newcomet, Philadelphia.—p. 519.

Diagnosis of Carcinoma of Large Intestine. M. Goldsmith, Pittsburgh. —p. 522.

Primary Sarcoma of Spleen: Case. E. Terzian, Geneva, Switzerland. —p. 526.

Leukosarcomatosis: Case. O. Hensel, New York.—p. 528.

Radium Emanation in Benign Uterine Affections. J. Muir, New York.—p. 531.
*Mercurochrome-220 in Intestinal Tuberculosis. H. F. Gammons, Lockport, New York.—p. 533.
Medical Beliefs: Old and New. M. Ginsburg, Philadelphia.—p. 534.

Value of Mercurochrome-220 Soluble in Intestinal Tuberculosis.—Gammons gave his patient 3 grains (0.2 Gm.) of the dye before each meal for six days and then 3 grains before each meal every third day. He is much more comfortable. His bowel movements are better formed and not as frequent.

New England J. Medicine, Boston

199: 967-1018 (Nov. 15) 1928

*Hinton Glycerol-Cholesterol Precipitation Test: Comparison with Wassermann, Kahn and Slide Tests in 1,600 Cases. A. W. Cheever and R. L. Splaine, Boston.—p. 967.
*Id.: Reaction: Diagnostic Criterion of Syphilis. R. L. Splaine and A. W. Cheever, Boston.—p. 971.
*Id.: As Means of Indicating Necessity of Continued Treatment. A. W. Cheever and R. L. Splaine, Boston.—p. 973.
Resuscitation from Asphyxia in New-Born and Others: Its Control and Treatment. Y. Henderson, New Haven, Conn.—p. 977.
Remarks on Causes of Asphyxia of New-Born and on Resuscitation. B. C. Sword; New Haven, Conn.—p. 979.
Impetigo Neonatorum: Control and Treatment. O. R. Chadwell, Boston.—p. 983.
Cancer of Tongue and Floor of Mouth: Demonstration of Case. F. W. O'Brien, Boston.—p. 985.
Scurvy, Pellagra and Sprue at Boston City Hospital. G. C. Shattuck, Boston.—p. 986.
Regional Anesthesia in Obstetrics: Twenty-Eight Deliveries Under Epidural Block. W. Pickles, Providence, R. I., and S. S. Jones, Tacoma, Wash.—p. 988.
Cystocele at Middle Age Treated by Interposition Operation. H. M. Clute, Boston.—p. 994.

Value of Hinton Test for Syphilis.—Sixteen hundred and ten cases were studied by Cheever and Splaine both clinically and serologically; 260 cases (560 examinations of blood by each of four methods) showed discrepant reactions, among which the Hinton test showed the largest number of positive reactions in persons with known syphilis and as few false positive reactions in the nonsyphilitic patients as any of the other methods. On the basis of this study, the authors believe the Hinton test to be much more sensitive for syphilis than the Wassermann, the Kahn or the slide test of Kline and Young.

Comparative Value of Hinton and Wassermann Tests.—Splaine and Cheever state that in the primary stage of syphilis, the Hinton reaction is but slightly better than the Wassermann. In the largest group of this series, that of asymptomatic syphilis, in which one must be guided either by serologic tests or by a less certain factor—judgment—the authors feel that the demonstrated increase of 50 per cent in sensitiveness and the practical absence of false positive reactions with the Hinton test make it a truly superior diagnostic criterion of syphilis.

Value of Negative Hinton Reaction.—Cheever and Splaine are of the opinion that a negative Hinton reaction is a safer criterion of cure than a negative Wassermann reaction on the blood.

199: 1019-1072a (Nov. 22) 1928

*Distribution of Peripheral Gangrene in Case of Subacute Bacterial Endocarditis. M. Finland and D. Davis, Boston.
Studies in Asthma: VIII. Incidence and Severity of Asthma According to Season of Year. F. M. Rackemann, Boston.—p. 1021.
Selection of Cases of Pulmonary Tuberculosis for Surgical Intervention. E. W. Archibald, Montreal.—p. 1025.
Hyperplasia of Endometrium: Cases. M. Criscitiello, Jr., Pittsfield, Mass.—p. 1034.
*Pyretotherapy in Treatment of Gonorrhea by Inducing Aseptic Abscess with Turpentine. S. Nittis, Detroit.—p. 1041.
Physiologic Theory of Reading Disability and Stuttering in Children. S. T. Orton, New York.—p. 1046.

Gangrene of Fingers in Subacute Bacterial Endocarditis.—In the case cited by Finland and Davis, an embolus to the left upper extremity was followed by loss of the radial pulse and later by the appearance of gangrene of the distal phalanges of all five fingers. At necropsy, the brachial artery and the radial as far down as the metacarpal bones did not reveal any embolus. It is conceivable that an embolus may have split up into many fragments which were carried to the terminal branches in the fingers.

Pyretotherapy in Treatment of Gonorrhea.—Nittis followed Fochier's technic in eleven cases, injecting from 0.2 to 0.5 cc. of nonrectified turpentine. Fever appeared within a few hours to two days following the injection. When the fever subsided, the abscess was either incised or aspirated and a gummy, brownish, slimy material, smelling strongly of turpentine, was obtained. Its volume varied from 30 to 70 cc. The pain, which was severe, and always accompanied the abscess ceased immediately after the latter was opened. Nonrectified turpentine is preferable to rectified turpentine, for the reason that fever and pain can be aborted at will by draining the pus. Seven patients were clinically cured completely, one without the aid of any other form of treatment. Five cases were given the aseptic abscess treatment combined with urethral injections, and in one urethral injections, intravenous vaccine and intramuscular milk were given during the fever period of the abscess. In three cases the urethritis persisted; however, such complications as were present were clinically cured. In one case the outcome should be considered doubtful, as far as the urethritis was concerned, but the complications were clinically cured. All the complications disappeared without prostatic massage, or any other form of treatment for those who had epididymitis. The excellent results thus gained in the complications are due, according to the author's belief, to the fact that the local temperature of the affected gland (prostate, epididymis) was increased both by the local gonococcal abscess and by the high temperature of the body from the aseptic abscess.

New Jersey M. Society Journal, Orange

25: 609-670 (Oct.) 1928

*Lymphosarcoma of Thymic Origin with Acute Lymphoid Leukemia: Case. G. J. Young and J. E. Spalding, Morristown.—p. 609.
Cystitis. S. E. Kramer, Perth Amboy.—p. 617.
Pylorospasm and Pyloric Stenosis in Infancy. E. G. Hummell, Camden.—p. 619.
Congenital Syphilis: Practical Methods of Prevention, Diagnosis and Treatment. A. J. Casselman, Camden.—p. 623.
Diagnosis and Treatment of Maxillary Sinusitis. C. S. McGivern, Atlantic City.—p. 632.
Duodenobiliary Drainage: Nonsurgical. M. Asher, Newark.—p. 635.
*Results of Gallbladder Operations. M. Danzis, Newark.—p. 642.
Carcinoma of Lung Metastasizing from Prostate. F. W. Rice, Morristown.—p. 645.

Lymphosarcoma and Acute Lymphoid Leukemia.—Young and Spalding report a case of lymphosarcoma of thymic origin, occurring in an 8 year old boy, who also had an acute lymphoid leukemia, which may reasonably be explained as a direct result of the thymoma and as undoubtedly originating from it. The patient died. A complete necropsy report is given.

Results of Cholecystostomy and Cholecystectomy.—The material presented by Danzis included an analysis of the operations, cholecystostomy and cholecystectomy. In a follow-up study after eighty-four cholecystostomies, it was found that nine patients required reoperation for recurrence of symptoms; five were improved but still suffered from vague symptoms referable to the upper abdominal region. Of 102 in whom cholecystostomy had been performed, 17 per cent or more suffered from recurrent attacks of gallbladder colic of sufficient severity to necessitate reoperation. In eleven of the patients who were subsequently operated on, stones were found in the gallbladder; four suffered from chronic cholecystitis, with extensive adhesions between the gallbladder, stomach and duodenum; one developed a severe attack of cholecystitis and pancreatitis three years after the original drainage operation; one had recurrent attacks of cholecystitis, biliary fistula, chronic pancreatitis and pancreatic lithiasis, which were disclosed at autopsy. Six of these patients are classified as improved, although they frequently suffer from symptoms of upper abdominal discomfort and occasional pain, but no jaundice. The percentage of cures among patients who remain free from symptoms for a period of three years after operation is 67.6 (sixty-nine cases). Of fifty-six treated by cholecystectomy in a series of 140 who were followed up for a sufficiently long period to render the statistics valuable, forty-seven, or 84 per cent, are classified as free from any symptoms; two are classified as improved, and three are untraced. The duration of time between operation and follow-up study ranges from two to twelve years. In a subsequent follow-up of 113 patients in whom cholecystectomy

was performed, included in this series, ninety patients, or 80 per cent, are free from any symptoms; eight are improved, and eight untraced. Those that are classified as improved suffer from mild gastric disturbances, such as an occasional attack of gastric flatulence or epigastric distress after meals; in only one case in this series was there recurrence of sharp abdominal pain. The roentgenogram in this case showed a shadow in the region of the pancreas, and the roentgenologic interpretation was "probably stone in the pancreas." This patient underwent a cholecystectomy three years after cholecystostomy. The conditions present at the time of the second operation were acute pancreatitis and cholecystitis. Careful exploration of the bile ducts did not show any stones. The gallbladder was removed, and drainage for the pancreatitis instituted. After the second operation the patient made a most uneventful recovery. The total number of cases reported in this series is 250. The total number of cholecystostomies was 107, or 42.4 per cent; of cholecystectomies, 141, or 57.2 per cent and of choledochostomy and cystectomy, two. There were sixteen deaths, 7.5 per cent occurring after the cholecystostomy and 5.6 per cent after cholecystectomy. The average number of days in the hospital after the two types of operations were 16.9 for cholecystectomy and 21.4 for cholecystostomy. A number of patients on whom the drainage operation was performed suffered at the time of admission either from a severe gallbladder infection or from some complicated constitutional disease, such as chronic nephritis, acute pancreatitis or chronic respiratory disease. Two patients included in this group had a very severe cholecystitis and pancreatitis at the time of the operation; one died three days after operation, and one twenty-two days later. Three died of peritonitis, following acute suppurative cholecystitis; one suffered from a ruptured gallbladder of three days' duration. This patient was moribund at the time of admission. Mortalities in cholecystectomy may be classified in two distinct divisions: (*a*) those occurring in cases uncomplicated by the presence of any other surgical condition, such as stone in the common duct, obstructive jaundice, chronic pancreatitis, or other constitutional disease, and (*b*) those occurring in cases with complications. In the uncomplicated cases the mortality in this operation in the author's series is 3 per cent, while the total mortality rate is 5.6 per cent. This included deaths from the operation in cases of ruptured gallbladder with peritonitis, two of biliary fistula with pancreatic stone, and two of stone in the common duct with cholangeitis. In the last thirty-five cases included in this series, twenty-eight of which were treated by simple cholecystectomy, drainage was used in only twelve cases; in the other sixteen there was complete abdominal closure. Not a single instance of undue morbidity or mortality can be attributed to failure to drain. The incidence of postoperative hernia in the series of 140 cases included in this group is 7 per cent for cholecystostomy as against 3.5 per cent for cholecystectomy.

New York State J. Medicine, New York

28: 1331-1394 (Nov. 15) 1928

Endothermy Versus Roentgen Ray and Radium in Treatment of Neoplastic Diseases of Skin and Mucous Membrane. G. A. Wyeth, New York.—p. 1331.
Pneumonia. J. D. Bonnar, Buffalo.—p. 1333.
Albuminuric Diabetes or Chronic Nephrosis. A. A. Epstein, New York. —p. 1335.
Tradition of Medicine. F. T. van Beuren, Jr., New York.—p. 1342.
Analysis of Medical and Blood Examinations of Automobile Refinishers in New York City. J. Meyers, New York.—p. 1345.
*Pathology of Aging Process. A. S. Warthin, Ann Arbor, Mich.—p. 1349.

Pathology of Aging Process.—Warthin says that senescence is due primarily to the gradually weakening energy charge set in action by the moment of fertilization. The immortality of the germ plasm is dependent on the renewal of this energy charge from generation to generation. Is old age inevitable? Yes; escape from it is possible only for those who meet a premature pathologic death. For those who live to their biologic limit, age cannot be escaped. Nor can it be deferred. Nor is rejuvenescence possible. The deferring of old age, the rejuvenating of the senescent individual, is but idle and foolish talk. What modern medicine has accomplished along the lines of hygiene and the prevention of disease has been only to increase the number of human individuals, both the fit and the unfit—unfortunately, too many of the latter kind—who come to maturity and to the period of senescence. More individuals will achieve their biologic life limit; and this means ultimately a much greater increase in the number of senile, more or less useless, human beings in the age decades of the eighties and the nineties. There will be some increase in the number who will reach the age of 100 years or even pass it, owing to their own family inheritance, but this number will not be greatly increased in the present period of evolution.

Wisconsin Medical Journal, Madison

27: 481-538 (Nov.) 1928

Tularemia (Francis' Disease): Fifty-Three Cases in Dayton, Ohio. W. M. Simpson, Dayton, Ohio.—p. 481.
Colitis: Chronic Nonspecific. R. C. Blankinship, Madison.—p. 485.
*Diabetes: Use of Synthalin and Myrtillin in Treatment. E. L. Sevringhaus, Madison.—p. 488.
Pneumoconiosis: Three Cases. R. I. Canuteson, Lawrence, Kan.—p. 491.
Spontaneous Rupture of Heart: Case. C. J. Smiles, Ashland, and W. S. Middleton, Madison.—p. 497.
Tuberculin Test: Why Not? O. Lotz, Milwaukee.—p. 500.

Treatment of Diabetes.—It is the opinion of Sevringhaus that it does not seem possible to make any generalization about the relative value of insulin, synthalin and a certain blueberry leaf preparation. In cases showing definite acidosis, acute infections, or any other of the emergencies common to diabetes, only insulin should be considered. Synthalin appears to be useful in those cases which require 20 units or less of insulin in a twenty-four hour period.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Disease in Childhood, London

3: 227-276 (Oct.) 1928

*Influence of Heredity in Exophthalmic Goiter. E. A. Cockayne.—p. 227.
*Pyelitis Complicated by Jaundice. E. Görter and G. O. E. Lignac. —p. 232.
Parathyroid B Infection with Purpura and Specific Bronchopneumonia: Case. H. P. Jameson and A. Signy.—p. 238.
*Chloride, Sugar and Calcium Contents of Cerebrospinal Fluid in Children. A. V. Neale and M. S. Esslemont.—p. 243.
*Etiology of Celiac Disease: Blood Fat. A. Moncrieff and W. W. Payne. —p. 257.
*Functional Vomiting in New-Born and Premature Infants. W. Emdin. —p. 262.

Heredity in Exophthalmic Goiter.—A large number of families have been reported in which more than one member of a generation has been affected with exophthalmic goiter, or in which the disease has occurred in several members of successive generations. In none of those in which such a pedigree is available does the number with exophthalmic goiter correspond with that expected of a mendelian dominant. This shows that, though it does not behave strictly as a dominant, it cannot be a recessive character. Cockayne reports four cases occurring in two generations. The age of onset was 7, 10, 24 and 40 years, respectively. All four affected members of the family had apparently healthy parents. Cockayne expresses the belief that the facts that the disease is so rarely present at birth and is so variable in its date of onset, and that it is so often transmitted by apparently healthy parents, are most easily explained by supposing that a constitutional weakness of the thyroid gland, a thyroid diathesis, rather than exophthalmic goiter itself, is inherited. If this is accepted, the pedigrees are no longer difficult to explain on the mendelian theory. The constitutional weakness of the gland is inherited as a dominant, and some of those who inherit it may remain apparently normal, while others may develop any or all of the signs and symptoms of the disease.

Pyelitis Complicated by Jaundice.—Görter and Lignac narrate the case of a boy, aged 3½ months, who fell ill with symptoms of an acute infectious complaint. During the first five days there was nothing to be found that could be considered as the cause of the fever; but then new symptoms appeared. The color of the child became yellow, the urine was dark brown, and at the same time the stools were completely decolorized, after having been fluid and dyspeptic some days before. At this time the patient became somewhat somnolent. Nothing abnormal could be detected in the lungs and heart. The abdomen was somewhat distended, the spleen was enlarged, palpable and rather hard. The liver was enlarged

and hard on palpation. No enlargement of the lymph glands or signs of rickets were present. The urine was dark brown, containing much bilirubin, albumin, many leukocytes, some red blood cells and epithelial cells, and large numbers of short gram-negative bacilli. The stools were grayish white, and did not contain any biliary pigment. On bacteriologic examination a pure culture of paracolon bacilli was obtained. The boy died from exhaustion several weeks afterward. At the necropsy it was found that both kidneys, infected by gram-negative bacilli and showing signs of pyelonephritis, were the center of the disease. The infection had been of a serious nature, not only by reason of the nature of the tissue changes in the pelvis (fibrinous pyelitis) and in the medulla and cortex of the kidney (cellular to suppurative nephritis), but also because of the presence of cholangeitis and pericholangitis with icterus and splenitis.

Chemical Status of Cerebrospinal Fluid of Children.—The sugar, chloride and calcium contents of the cerebrospinal fluid of twelve children suffering from various diseases without meningeal involvement were within normal limits, with the exception that in acute pneumococcal infection a subnormal chloride content was present. The current view that tuberculous meningitis is constantly associated with a low chloride content in the cerebrospinal fluid is criticized by Neale and Esslemont. The necessity for considering the stage of the illness when reading biochemical results is indicated. Comparisons are drawn between the chloride content in tuberculous meningitis and other forms of meningitis. When examinations are made at frequent intervals during the course of the illness, curves of the results show special features in each kind of disease. The tuberculous cases show a fall in the earlier stages and a rise in the later stages. Pneumococcal cases show a progressive fall toward the fatal issue. Meningococcal cases show a similar fall when the disease is fatal, but in convalescence there is an elevation to within the normal. The sugar curve in tuberculous meningitis is similar to the chloride curve in the same cases. A fall to zero point may occur during the illness and occasionally remain until death. In fatal meningococcal meningitis and in pneumococcal meningitis, a progressive diminution in the sugar content of the cerebrospinal fluid occurs. The sugar in the cerebrospinal fluid in patients recovering from meningococcal infection shows an early fall, followed by a gradual rise to normal. Therefore a sugar curve which commences to rise is of favorable prognostic import. Evidence is given in support of the view that in nonmeningitic and meningitic cases, the amount of chloride in the cerebrospinal fluid varies to some degree with that in the blood. A number of observations have been made on the calcium in the cerebrospinal fluid. In nonmeningitic disease it is shown that the calcium concentration is within the normal. Also, in conditions in which inflammatory change occurs in the meninges, the calcium is usually above the normal level, and this is more marked in the suppurative types of meningitis. No calcium deficiency was detected in patients having convulsive seizures in meningitis.

Blood Fat in Celiac Disease.—Moncrieff and Payne suggest that celiac disease is a primary disorder of fat metabolism associated with an increase of the fat in the blood and in the feces, where possibly it is being excreted.

Functional Vomiting in New-Born and Premature Infants.—Emdin explains the vomiting in the new-born infant as follows: The sympathetic system being insufficiently developed, the nervous action in the new-born infant is chiefly vagal, with the result that there is a vagotonia. This results in a tendency toward increased movements of the bowel and, therefore, a tendency toward vomiting. Stimulation of the vagus is followed by relaxation of the cardiac sphincter according to recent investigations; therefore an inhibited vagal action would account for the atony of the sphincter and that this atony is important in this connection Emdin is convinced. The infant vomits with ease and comparative, sometimes actual, pleasure, whereas the adult is compelled to experience nausea and retching in the same act. In the adult a period of nausea is followed by violent contractions of the abdominal musculature with contraction of the diaphragm in order that the act may be completed. In the author's opinion, the chief obstacle which the adult stomach has to overcome is the closed cardiac sphincter; whereas in the infant, owing to insufficiently developed sphincteric control, the cardiac sphincter is readily overcome and vomiting occurs easily. Carrying this line of explanation further, within the first week of life most normal infants develop sufficient inhibitory (sympathetic) control to stop their tendency to vomit. Premature infants and weaklings require still more time in order to develop this inhibition to a sufficient degree, and the smaller the infant, the more time required, and the more difficult the achievement, owing to the facility with which infection takes a grip on an organism weakened congenitally and still further weakened by food loss. Weight is not the only factor concerned, because a premature infant born with comparative constitutional strength, which embodies a certain amount of inhibitory control, will more readily tend to survive. Or, vice versa, a child of normal birth weight with insufficient or slowly developing inhibitory control will go on vomiting for a longer period than its better equipped brother, and thus lay itself open to the acquisition of habit. Nor is it a long step from such vomiting, if untreated and especially if of a neurotic character, to habitual vomiting.

British Medical Journal, London

2: 779-828 (Nov. 3) 1928

Recent Advances in Treatment of Gastric Diseases. A. F. Hurst. —p. 779.
Results of Surgical Treatment of Gastric and Duodenal Ulcer. A. J. Walton.—p. 784.
*Gastric and Duodenal Ulcer. L. R. Broster.—p. 786.
*Extensive Pulmonary Embolism Following Fracture of Tibia and Fibula: Case. V. Cotton-Cornwall, C. W. Ponder and W. H. Evans.—p. 789.
*Erythrocyte: Punctate Basophilia, Diffuse Polychromasia and Reticulation. W. E. Cooke.—p. 790.
Bilateral Obstruction of Central Retinal Arteries. F. Juler.—p. 791.
*Myomectomy During Pregnancy. R. Vaudescal.—p. 793.
Abdominal Aneurysm: Death Seventeen Years and Seven Months After Operation. W. I. de C. Wheeler.—p. 793.
Chronic Nasal Sinusitis with Mental Symptoms. J. Adam.—p. 794.
Onychia Treated with Vaccine. J. P. Hastings.—p. 794
Fatal Case of Accidental Poisoning by Benzene Vapor. G. Carter. —p. 795.

Analysis of Symptoms of Peptic Ulcer.—Two hundred patients treated by operation are reported on by Broster. Pain was absent in only three cases—one duodenal ulcer, and two gastric ulcers. Intermittency of pain occurred in more than 75 per cent of the cases. The pain has been constant in less than 10 per cent; in a small percentage the pain has been intermittent at first and constant later. In the cases of pyloric ulcer this late constant pain has run pari passu with the decrease in the intermittency. In only a small percentage of cases has the pain been unrelated to food, and in a smaller percentage has it occurred within half an hour after food. Vomiting was present in 50 per cent of duodenal ulcers; 88 per cent of gastric ulcers, and 70 per cent of pyloric ulcers. Hematemesis was present in 6 per cent of duodenal ulcers, 24 per cent of gastric ulcers, and 7 per cent of pyloric ulcers. Melena was present in 26 per cent of duodenal ulcers; 7 per cent of gastric ulcers, and 21 per cent of pyloric ulcers. Multiple ulcers were present in eight cases. Posterior gastro-enterostomy was the operation of choice. The immediate mortality was 6.7 per cent. Of 121 patients replying to a questionnaire, 30 per cent reported very good results, 47 per cent good results; 10 per cent very fair results; 7.8 per cent fair results, and 5 per cent poor results. A further analysis of the very good and good cases shows that the total average cure without a relapse for the whole series is 3.3 years. The good results from partial gastrectomy amount to 80 per cent, and from posterior gastro-enterostomy in gastric ulcer, to 89 per cent, in duodenal ulcer, to 77 per cent. The combined average from posterior gastro-enterostomy works out much the same as that for partial gastrectomy—that is, 80 per cent.

Extensive Pulmonary Embolism Following Fracture.—Cotton-Cornwall et al. report a case of fracture of the left tibia and fibula. The limb was fixed in plaster of paris. Six weeks after the accident, union appeared perfect and there was no shortening of the leg; there was a moderate amount of edema of the ankle and leg to the knee, but no varicosity of the superficial veins. The ankle and knee, which were very stiff, were forcibly moved through a few degrees, and the nurse was instructed how to massage and move the limb; the patient was given permission to walk on crutches. She stated that she was sick, but there was no discoverable cause, and she did not look ill. A sedative alkaline mixture was given, and it was reported that the sickness ceased the same day, and that the patient ate

normally afterward until the time of her death two days later. The heart and lungs were removed and dissected out. On opening the right ventricle and pulmonary artery, a long clot of about the size of the lumen of the internal iliac vein was found. This had evidently folded itself so that two ends were passing into the right branch of the pulmonary artery, and two into the left, thus preventing the blood flow to the lungs and producing sudden death; the clot could not be extracted by traction. There was also a free end pointing to the pulmonary valve.

Study of Erythrocyte.—Cooke asserts that punctate basophilia, diffuse polychromasia and reticulation may be produced in any erythrocyte.

Myomectomy During Pregnancy.—Vaudescal emphasizes the fact that if operation is undertaken during pregnancy, it is necessary in 62 per cent of cases to perform hysterectomy; operative intervention during pregnancy should, therefore, be postponed as long as possible in order to obtain a living child.

Lancet, London

2: 1009-1060 (Nov. 17) 1928

Allergy: Clinical and Biologic Study. H. W. Barber and G. H. Oriel.—p. 1009.
*Phenomenon of Reticulation and Alteration in Size of Red Blood Corpuscles After Liver Therapy. L. S. P. Davidson and J. G. McCrie.—p. 1014.
Medicolegal Aspects of Fractures. E. W. Hey Groves.—p. 1017.
Synergistic Action of Estrin and Pituitary Extract on Isolated Uterus. A. W. Bourne and J. H. Burn.—p. 1020.
Case of Pluriglandular Syndrome: "Diabetes of Bearded Women." W. H. Brown.—p. 1022.
*Urethral Calculus of Unusual Size. H. R. B. Hull and R. J. G. Parnell.—p. 1023.
*Pain Sense of Parietal Pleura. A. I. G. McLaughlin.—p. 1023.

Effect of Liver Therapy on Erythrocytes.—Davidson and McCrie believe that it would be a matter of considerable importance if two types of secondary anemia could be shown to exist. In both a low color index due to deficiency of hemoglobin is present. One type is characterized by a preponderance of small cells, while the other shows a Price-Jones curve similar to that found in pernicious anemia during the early part of the remission stage. Liver therapy itself cannot remove the causal condition in secondary anemia, but, by producing the maturation of megaloblasts and normoblasts, it would diminish the number of abnormal red blood corpuscles entering the circulation and thus reduce the blood destruction which is proceeding in the reticulo-endothelial system.

Unusually Large Urethral Calculus.—Hull and Parnell's patient gave a history of gonorrhea seven months previously, complicated by epididymovasitis. While Cowper's glands were being palpated, a hard spindle shaped body was found lying in the long axis of the bulbous urethra, apparently within its lumen. The patient was unaware of its presence. His health during the past four months had been excellent, and there was no history of impaction. Attempts at urethroscopy were unsuccessful. A sound was passed after meatotomy. This showed that the foreign body was a stone in the bulb and removal through a perineal incision was easily effected. The stone weighed 163 grains (10.6 Gm.); its length was 1¾ inches and its greatest diameters were ¾ inch and ⅝ inch (45 by 20 by 16 mm.). On section it had a hard outer shell, covering a laminated phosphatic core. That there was considerable distention of the bulb was shown by the fact that, during convalescence, the patient had to press the perineum over the bulb after micturition in order to avoid dribbling of urine.

Pain Sense of Parietal Pleura.—McLaughlin's observations have led him to the conclusion that the parietal pleura is richly endowed with pain sense. The parietal pleura gives rise to a definitely localized pain when a needle passes through it. The needle in passing through the chest wall evokes pain in only three structures—the skin, the rib periosteum (if it should be touched), and the parietal pleura. The intercostal muscles and other structures are apparently insensitive, at least to the stimulus set up by the needle. The patient describes the skin pain as an "ordinary" sharp pain, whereas the pleural pain is likened to a severe toothache or "neuralgia." If the pleura is not anesthetized, pain in some degree will be evoked by the passage of a needle in almost every case. When a thin and very sharp needle is used little pain is experienced, but a large and comparatively blunt needle evokes a considerable degree of pain. These facts suggest very strongly that the chief stimulus necessary to evoke pleural pain is tension or stretching.

Medical Journal of Australia, Sydney

2: 487-514 (Oct. 20) 1928

Some Crippling Conditions and Their Treatment. L. O. Betts.—p. 488.
Cardiac Dyspnea. F. R. Fraser.—p. 491.
*Ulnar Paralysis: New Operation. L. Potter.—p. 498.
Enuresis. E. H. M. Stephen.—p. 502.
Appendicitis in Children. P. L. Hipsley.—p. 503.

Operation for Ulnar Paralysis.—The object of the operation described by Potter is primarily the stabilization of the appropriate metacarpophalangeal joints by opposing the action of the long extensor and of the flexor sublimis digitorum. This is done by dividing transversely the tendon of the paralyzed deep flexor as it traverses the osteofibrous canal of the finger; the proximal part of the divided tendon is transplanted dorsally and is used to fix the metacarpophalangeal articulation. An attempt is made to secure effective movement of the distal phalanx by transplanting dorsally the distal part of the same tendon.

Bruxelles-Médical, Brussels

9: 1-32 (Nov. 4) 1928

Maturation of Uterine Muscle Fibers During Pregnancy. H. Keiffer.—p. 1.
*Action of Ephedrine on Anesthetized Animals. J. la Barre.—p. 3.
Treatment of Hypertrophy of Prostate. Tant.—p. 8.

Cardiovascular Action of Ephedrine on Anesthetized Animals.—La Barre found that ephedrine (which salt La Barre used was not stated), administered intravenously to cats anesthetized with chloroform, does not produce the cardiovascular accidents that are produced by the administration of solution of epinephrine hydrochloride. This fact represents a new difference in the physiologic action of these two substances, which are so closely related chemically. Owing to the absence of an ephedrinochloroform syncope in the cat, the author believes that the pharmacologic point of attack of ephedrine differs from that of epinephrine. Ephedrine, therefore, should not be considered as a purely sympathicotropic substance.

Paris Médical

2: 341-356 (Oct. 27) 1928

Late Prognosis in Pleurisy. C. Achard.—p. 341.
*Roentgenologic Diagnosis of Hydatid Cyst. N. Busila and O. Meller.—p. 350.
*Lepra-Like Accumulations of Tubercle Bacilli. J. Dumont.—p. 355.

Roentgenologic Diagnosis of Hydatid Cyst of Lung.—Busila and Meller report the case of a woman who had been advised to enter a sanatorium for pulmonary tuberculosis but in whom a hydatid cyst of the left lung instead of tuberculosis was found on roentgen examination. The case is of particular interest because hydatid cysts usually develop in the right lung.

Lepra-Like Accumulations of Tubercle Bacilli in Cells of Tuberculous Pus.—In the examination of various kinds of tuberculous pus, particularly that from tuberculous pyelonephritis, Dumont has occasionally noted extraleukocytic and intraleukocytic accumulations of tubercle bacilli very closely resembling the typical accumulations of lepra bacilli found in the mucus of the nose and pharynx of patients suffering from leprosy. The resemblance is so marked that even a distinguished bacteriologist was deceived by one of the author's preparations.

Presse Médicale, Paris

36: 1361-1376 (Oct. 27) 1928

*Treatment of Hyperthyroidism. L. Dautrebande.—p. 1361.

New Views on Iodine Treatment of Hyperthyroidism.—In a review of the vicissitudes in popularity experience by the iodine treatment of hyperthyroidism, from its introduction in 1820 up to the present, Dautrebande finds that the contradictory results obtained by different investigators can be explained only on a geographic basis: in America iodine has a harmful action on patients with thyrotoxic adenoma, whereas in Belgium it has the same beneficial effect on patients with thyrotoxic goiter that it has on patients with true exophthalmic goiter. He also believes that the general opinion that iodine exerts only a transient action is incorrect because by giving continued and progressively higher doses of the drug one may obtain prolonged

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effects. After several days of treatment with from 10 to 20 drops of compound solution of iodine, the basal metabolism falls and the general condition of the patient improves; in order to maintain this improvement the basal metabolism is tested frequently and the dose of iodine is increased each time that the basal metabolism is found to have risen. The manner in which the iodine is administered is important: as soon as the daily dose of 20 drops is exceeded it is advisable to divide it into 2, 3 or 4 parts because iodine is eliminated rapidly (50 per cent can be recovered from the urine within twelve hours of its ingestion). The histories of a case of true exophthalmic goiter and of a case of typical toxic adenoma of the thyroid are given to illustrate the author's contention that fractional doses of iodine may be efficacious in cases of hyperthyroidism which resist treatment with progressive doses.

36: 1377-1392 (Oct. 31) 1928

*Exanthematous Fever of Mediterranean Coast. Boinet, J. Piéri and Dunan.—p. 1377.

New Studies on Exanthematous Fever of Mediterranean Coast.—Boinet et al. still maintain that the exanthematous fever which occurs along the Mediterranean coast, particularly in the region of Marseilles, is not a form of typhoid. It is a disease of summer. It is not contagious; all attempts to inoculate a guinea-pig with the disease have given negative results. The black spot (tache noire) appears to be the point of inoculation of the disease. The exanthematous spots are in reality papules. The black spot, papular eruption, benign nature of the disease, epidemiologic conditions, serologic studies and negative guinea-pig inoculations all serve to differentiate it from typhoid.

Schweizerische medizinische Wochenschrift, Basel

58: 1005-1028 (Oct. 13) 1928

*Progressive Muscular Dystrophy and Heredity. M. Minkowski and A. Sidler.—p. 1005.
Effect of Fructovegetable Diet on Blood Pressure. M. E. Bircher.—p. 1010. C'en.
Case of Dystopia Testis Transversa. R. Howald.—p. 1014.
Iodized Salt in Goiter Prophylaxis. O. Stiner.—p. 1014.
Modern Dietetics. A. Gigon.—p. 1016.

Progressive Muscular Dystrophy and Heredity.—Minkowski and Sidler made a study of thirteen cases of progressive muscular dystrophy occurring in ten families in an isolated community of 1,700 persons, where inbreeding had been common for generations. It could not be ascertained that there had been any cases of the disease in the direct ancestry of the patients. The family trees of the patients could all be traced back to two male ancestors living in 1600. There had been frequent intermarriages between each of these two families as well as within them. In these cases, in all of which the initial symptoms were in the pelvic girdle, the disease appears to have depended on a doubly recessive hereditary process. From the standpoint of heredity, cases starting in the pelvic girdle (pseudohypertrophic type) must be separated from those of the fasciohumoral type. The latter, according to Sidler, always represent a dominant hereditary process. Familial idiocy, dwarfism or other phenomena of degeneration were not found in the consanguineous population under discussion. A comparative lack of fertility in the youngest generation was noted; heretofore families of from ten to sixteen children were common. Among the brothers and sisters of the patients with progressive muscular dystrophy there was a high infant mortality, which was not seen among the siblings of the parents of these patients. Eight of the patients were male and five were female, and the disease appeared to be transmissible through either parent.

Archivio Italiano di Chirurgia, Bologna

21: 417-528 (June) 1928

*Sarcoma of Prostate. A. Costa.—p. 417.
Thyroid and Skin Grafts in Sensitized Animals. L. Carmona.—p. 436.
*Nomenclature of Radical Interventions in Gastroduodenal Ulcer. G. Pototschnig.—p. 457.
Chronic Volvulus of Small Intestine Resulting from Torsion of Mesentery. G. Lusena.—p. 488.
*Surgical Intervention in Appendicitis in Subacute Phase. G. Bettazzi.—p. 509.
*Pathogenesis of Chronic Occlusion of Duodenum. L. Sussig.—p. 521.

Sarcoma of the Prostate.—In Costa's case, in a man, aged 45, the painful symptoms and retention of urine appeared almost simultaneously with an intense icterus. A little later the gallbladder and the head of the pancreas became intensely painful on palpation, and at necropsy grave metastatic neoplastic infiltrations were demonstrated. The tumor itself had apparently been asymptomatic for a long time, although it metastasized freely.

Need of a More Exact Terminology for Radical Interventions in Gastric and Duodenal Ulcers.—Pototschnig observes that surgeons do not always express themselves with the same accuracy and precision that they employ in the performance of their operations. Resection of the stomach has been defined as a "partial gastrectomy," which is manifestly improper, since gastrectomy signifies complete extirpation of the stomach, and if it is complete it cannot also be partial. From the true and proper resection of the stomach one must distinguish the category of interventions in which a part of the gastric wall is removed without interrupting the continuity of the organ. For such interventions the words "excision" or "extirpation" should be used. For similar reasons, the term "duodenectomy," used repeatedly by various surgeons to signify a resection confined to the duodenum, in cases of duodenal ulcer, should be dropped from the vocabulary. No one certainly will feel called on to remove the duodenum completely in order to banish a duodenal ulcer. Pylorectomy signifies solely the removal of the pyloric sphincter and hence is improperly used when applied to interventions in which it becomes necessary to remove, in addition to the pylorus, a considerable portion of the stomach.

Surgical Intervention in Appendicitis in the Subacute Phase.—The determination of leukocytosis (Curschmann test) and the Sonnenburg diagnostic test (administration of an oily purgative) were carried out consistently by Bettazzi in a series of 200 cases that came to operation, and in almost all they were found a great aid in determining the period of evolution of the disease. It was found always that if, in patients who had had an attack of appendicitis, the leukocytes did not exceed 6,000, and if the administration of an oily purgative did not cause an increase of temperature, it was certain, in the absence of any clinical symptom of importance, that the disease had reached a period of sufficient quiescence to justify operation. Under such circumstances the surgical intervention was always simple and typical, with excellent healing of the wound by first intention. In eleven of a series of sixty cases in which he had not applied the leukocytosis test, he encountered notable operative difficulties, although the disease was apparently in the quiescent period and although the Sonnenberg test had been negative.

Peculiar Type of Chronic Occlusion of the Duodenum.—In Sussig's case, the occlusion of the duodenum was not due to any of the ordinary mechanical factors. An artery, which, in its abnormal course, appeared stretched over the ventral segment of the duodenum as a chord subtends an arc, had effectively compressed the bowel.

Clinica Medica Italiana, Milan

59: 193-282 (May-June) 1928

*Arteriosclerosis of Pulmonary Artery. A. Costa.—p. 193.
Congenital Myotonia: Myographic and Electromyographic Researches. L. Condorelli.—p. 225.
Aleukemic Lymphadenosis with Hemocytoblasts in Lymphatic Locations from Staphylococcic Septicemia. I. Bettoni.—p. 269.

Arteriosclerosis of the Pulmonary Artery, with Reference to So-Called Primary Sclerosis and to Ayerza's Disease.—Costa brings out the point that, at least from the anatomic point of view, Ayerza's disease is not clearly independent of other forms of pulmonary arteriosclerosis, and that it embraces, on the other hand, anatomicopathologic manifestations that have nothing to do with arteriosclerosis.

Policlinico, Rome

35: 341-392 (July 1) 1928. Medical Section

Mechanism of Physiologic Tracheal Respiration. C. Minerbi.—p. 341.
*Diagnosis of Tracheo-Esophageal Fistula. T. Pontano.—p. 348.
Clinical and Radiologic Recognition of Gastric and Duodenal Syphilis. A. Pozzi.—p. 365.

Diagnostic Value of a Clinically Primary Tracheo-Esophageal Fistula.—Pontano says that the existence of a

communication between the esophagus and the trachea may be at least suspected if, in an apparently healthy person in whom the pharyngolaryngeal examination is negative, attacks of coughing (almost convulsive) suddenly develop on ingestion of liquids or solids, and if the coughing is accompanied by cyanosis, dysphonia and rapid emaciation. The existence of such a communication may be affirmed if, on the gentle introduction of a sound into the esophagus, air escapes through the sound. The exact site of the lesion may be determined by noting the distance from the dental arch. A radioscopic examination is a valuable means of establishing a tentative diagnosis of a tracheo-esophageal communication. An erroneous diagnosis may, however, result from the fact that in itself it is not a sufficient means of distinguishing tracheo-esophageal communications from the passage of the opaque medium into the trachea in case of especially high esophageal stenosis. A pure syndrome of tracheo-esophageal communication may become quickly obscured by secondary pulmonary syndromes, which may fatally complicate the lesion.

Archiv für klinische Chirurgie, Berlin

151: 651-818 (Oct. 19) 1928

*Seasonal Variations in Occurrence of Gastric and Duodenal Ulcers. K. Hutter.—p. 651.
*Wound Healing: Effect of Embryonal Tissue. W. Schloss.—p. 701.
*Degastro-Enterostomy for Unhealed or Recurrent Peptic Ulcer. H. Jansen.—p. 706.
Bronchial Fistula: Analysis of Twenty-Four Cases. S. Kusmin.—p. 712.
*Prolapse of Rectum: Etiology and Treatment by Injection of Alcohol. M. J. Lorin-Epstein.—p. 728.
Histologic Changes in Vessel Walls and Their Innervation Following Sympathectomy. O. Nikolajeff.—p. 744.
Case of Severe Cardiospasm Cured by Esophagogastrostomy. H. Toole.—p. 761.
*Removal of Submaxillary Salivary Glands in Operations for Carcinoma of Lower Lip. E. L. Beresow.—p. 767.
*Is Ileocecal Valve Insufficiency a Clinical Entity? W. Tönnis.—p. 785.
Prognosis in Fracture of Os Naviculare Manus. M. Hirsch and K. Goldhamer.—p. 793.
*Plastic Gastrostomy. G. Zechel.—p. 805.
*Erythrocyte Sedimentation Rate in Citrated Plasma in Malignant Tumors. F. K. Kessel.—p. 811.
Case of Carcinoma of Stomach and Diverticulum of Duodenum. V. Mandler.—p. 814.

Seasonal Occurrence of Peptic Ulcer.—Examination of a considerable number of cases of gastric and duodenal ulcer, in both men and women (the duodenal ulcers being only in men, and about 25 per cent of the gastric ulcers being in women), has convinced Hutter that there is some etiologic relation between the occurrence of these ulcers and the seasons. Gastric ulcers occurred during the cold months of the year, from December to February, as did recurrences. The peak of the incidence curve of duodenal ulcer, on the other hand, was reached in May. The incidence was lowest in November. Patients under 40 comprised the May cases. Previous gastric disturbances occurred more often in all the cases of gastric ulcer than has hitherto been believed to be the case. Gastric ulcer in women, especially when distant from the pylorus, is prone to heal spontaneously. In the case of men the ulcer is always near the pylorus and exhibits less tendency to spontaneous healing.

Use of Embryonal Tissue Extract to Promote Wound Healing.—Schloss proved experimentally that embryonal tissue extract promotes wound healing when there is present a tendency to slow or imperfect healing. The embryonal material used consisted of specially prepared, macerated rabbit embryos removed from the uterus immediately after the mother rabbit had been bled to death. Forty patients, presenting various conditions, such as abscesses, postoperative fistulas, phlegmons, carbuncles and osteomyelitic granulations, were treated with this tissue. In 57.5 per cent of the cases very good results, in 15 per cent good results, and in 12.5 per cent fair results were obtained. In 15 per cent no effect was noted. The action seems to be local. No injurious effects occurred in any case.

Degastro-Enterostomy for Unhealed or Recurrent Peptic Ulcer.—Jansen reports four cases in which a degastro-enterostomy was performed. He emphasizes the need for resecting all of the scar and of the ulcer bearing area, conserving as much of the intestine as possible, suturing the latter transversely, and resorting to resection with end to end anastomosis if not sufficient tissue remains to insure against subsequent constriction of the lumen. In two of the cases the ulcer recurred after the degastro-enterostomy. In one case this was confirmel by a third operation. The other patient refused further operation. He points out that in such cases an extensive resection of the ulcer zone of the stomach should be done in addition to degastro-enterostomy.

Injection of Alcohol in Prolapse of Rectum.—Lorin-Epstein describes his method of injecting from 50 to 60 cc. of 75 or 80 per cent alcohol in cases of prolapse of the rectum, for the purpose of effecting a sclerosis. This is done under lumbar anesthesia, although it is possible to inject without an anesthetic if a higher percentage of alcohol (80 or 90) is used. However, the anesthetic is recommended. The injections are made between the mucosa and the muscularis; on the outer wall of the rectum; through the whole wall of the bowel, from within outward, toward the levator and the perirectal region; into the ischiorectal fossa, especially between the rear wall of the rectum and the sacrum and coccyx, and into the sphincter, but avoiding the skin. Results are not apparent for several months as the sclerosing process develops slowly. Untoward effects were not noted in any case, except slight pain in the injected regions, lasting only a few days. The method is said to be preferable to surgical intervention because it does not disturb anatomic relations nor does it interfere with innervation. Function is restored. Massage may be of some value.

Removal of Salivary Glands in Operations on Lower Lip for Carcinoma.—Beresow insists that in all these cases the submental and submaxillary salivary glands must be removed as well as all lymph nodes, if recurrence is to be prevented. He reports briefly the answers to questionnaires sent to fifty well known surgeons in all parts of the world with regard to their preference for such a procedure. Thirty-eight were in favor of it; twelve were opposed to it except when specially indicated by observations made either before or at the time of operation.

Insufficiency of Ileocecal Valve.—Tönnis has determined experimentally that insufficiency of the ileocecal valve alone is not a definite clinical entity. Paralysis of the ileocecal sphincter is followed by a backing up of the contents of the cecum into the ileum. The irritation of the ileum induced thereby sets up a vigorous peristalsis of that part of the intestine and the contents are projected into the cecum. If the action of the cecum is normal, a prolonged stasis does not occur. If, however, there exists a functional disturbance of the colon in addition to the insufficiency of the ileocecal valve, a distinctly pathologic condition must be considered.

Plastic Gastrostomy.—Zechel describes an operation by which a tube is fashioned from a flap taken from the wall of the stomach, which prevents any contact of gastric secretions with the skin of the abdomen or with any of the tissues through which the stomach tube or catheter ordinarily passes. This tube flap is passed through the abdominal wall in the median line, then outward under the skin for several centimeters, and into an opening made in the skin to which the margins of the tube are carefully sutured. The stomach flap is taken from the anterior wall of the stomach near the cardia. A case is cited in which this operation was performed successfully.

Sedimentation Rate of Erythrocytes in Malignant Tumors.—Kessel has employed the Fahraeus reaction, according to Linzenmeier's modification, in ninety-three cases of carcinoma and twelve cases of sarcoma for the purpose of reaching a conclusion as to its diagnostic value. The results obtained were so extremely variable that he is convinced that the sedimentation rate of erythrocytes is of no value whatever in the diagnosis of malignant tumors.

Deutsche medizinische Wochenschrift, Berlin

54: 1659-1704 (Oct. 5) 1928. Partial Index

Length of Human Life and Struggle Against Disease. M. Rubner.—p. 1659.
Problems in Obstetrics and Gynecology. H. Sellheim.—p. 1662.
Pathologic Labors In and Outside the Clinic. L. Fraenkel.—p. 1665. C'en.
Temporary Roentgen Amenorrhea. H. Wintz.—p. 1667.
*Action of Strophanthin on Sufficient and Insufficient Heart. S. W. Anitschkow and P. Trendelenburg.—p. 1672.
Relapsing Fever Paralysis. A. Brüggemann.—p. 1674.
Value of Prophylactic Immunization Against Typhoid. S. Hirsch.—p. 1676.
*Dry Buttermilk. F. Gierthmühlen.—p. 1678.

Action of Strophanthin on Sufficient and Insufficient Heart.—Anitschkow and Trendelenburg observed the action of strophanthin on heart-and-lung specimens (from dogs and cats) with spontaneous or artificially produced decompensation. Under the influence of strophanthin in therapeutic doses, the output of the heart was increased from 30 to 100 per cent (average 74.33 per cent). Strophanthin had little or no effect on the sufficient heart.

Dry Buttermilk.—In Gierthmühlen's experience a preparation of dry buttermilk gave good results in exudative diseases in children and as supplementary feedings to prematurely born infants.

54: 1705-1744 (Oct. 12) 1928. Partial Index

Position of Man in Nature in Relation to Length of Life and Intelligence. M. Rubner.—p. 1705. C'tn.
*Calmette's Inoculation Against Tuberculosis: Questionnaire.—p. 1707. C'td.
*Etiology of Cancer from Standpoint of Prevention. O. Teutschlaender.—p. 1710.
Indications for Interruption of Pregnancy. O. Pankow.—p. 1712.
Advantages of Rough Diet. H. Salomon.—p. 1716.
Spontaneous Thrombosis of Sagittal Sinus. K. Arold.—p. 1721.
Testing Hearing of Motor-Car Drivers. Birkholz.—p. 1727.

Calmette's Inoculation Against Tuberculosis: Questionnaire.—Certain of Calmette's assertions have, according to Bessau, been disproved. B C G, he says, does produce specific tuberculous changes, and under certain conditions it may be propagated in animal experiments. Further, it produces allergy when introduced parenterally. This, taken together with the observation that allergy is exceptional on stomachal introduction, throws doubt on the efficacy of this route for the administration of the vaccine, even in the first few days after birth. As to the entire lack of danger and the degree of success claimed, the statistics presented by Calmette are not wholly adequate. Necropsy reports on the infants who died are lacking and the mortality from tuberculosis among nonvaccinated infants cited for comparison appears much too high as compared with statistics for Germany and Denmark. A certain degree of success is still, however, shown by the figures, but Bessau questions what part of this may be due to general prophylaxis, which, he thinks, would be better among the class of parents who consented to the vaccination. The treatment should, he believes, be reserved for selected cases under special observation. In general, Czerny and Pfeiffer agree with Bessau. Neufeld has used the method on sheep and cattle as well as on laboratory animals, and found that it produced a limited immunity. He would like to see a series of comparative experiments carried out on cattle with Calmette's and Behring and Koch's methods.

Etiology of Cancer from Standpoint of Prevention.—Teutschlaender discusses three etiologic factors, the exogenous factor acting on cells capable of proliferation, predisposition and exposure. From the practical standpoint, an understanding of the factors connected with occupation and manner of life that expose to cancer and of the relatively specific noxae (such as exposure to dust and gases and excessive formation of indol in the intestine) is more important than knowledge of the fine biologic and physicochemical changes that convert a normal body cell into a cancer cell.

Medizinische Klinik, Berlin

24: 1575-1614 (Oct. 12) 1928

*Treatment of Acute and Chronic Arthritis. F. Külbs.—p. 1575.
*At What Time Should School Begin in the Morning? R. Glauber.—p. 1576.
Renal Diabetes. P. Bonem and P. Hecht.—p. 1580.
Gangrene After Injection of Procaine Hydrochloride and Epinephrine in Finger. F. Halla.—p. 1582.
Clinical Course of Lipoid-Cell Tonsillitis. K. Lorentz.—p. 1582.
Poliomyelitis Epidemic in Saxony. Walcha.—p. 1584.
Case of Migraine. E. Wiener.—p. 1586.
Respiratory Gymnastics—Inspiratory Mask. Eckert.—p. 1589.
Reply. A. von Liebermann.—p. 1589.
Crepitation, Cooing, etc., in Diagnosis of Pulmonary Caverns. A. Winkler.—p. 1590.

Treatment of Acute and Chronic Arthritis.—Protein therapy has been found by Külbs to be a valuable adjunct to other treatment. For intramuscular injection, the protein preparation may be combined with the patient's blood. Milk is the best protein for use in gonorrheal arthritis. In the often striking results of balneotherapy, the skin probably plays a part. A sponge, particularly a rubber sponge, dipped in hot water, makes an easy-fitting compress for a joint. He has seen rheumatic purpura, associated with pain and swelling of the joints, respond to arsenic or arsphenamine after it had resisted salicylic acid for weeks. Local treatment of the tonsils with iodine or a similarly acting remedy may be indicated in cases in which there is no tendency to sore throat and in which demonstrable changes in the faucial ring do not exist. He has seen patients in whom a flare-up of an old chronic arthritis, which no longer caused symptoms, occurred when a patient with acute febrile follicular tonsillitis was brought into the ward, although they presented not the slightest changes in the throat.

At What Time Should School Begin in the Morning?—This, Glauber believes, is a matter on which pediatricians should give advice. He studied the sleep needs and habits of children and concludes that school should not begin before 9 o'clock. This is more important for young persons just before and during puberty than for younger children, since the former are even more sensitive to loss of sleep. His advice as to the opening hour applies to the spring as much as to the winter months on account of the increased metabolism in the spring, which brings with it the need for more sleep. He believes that the change advocated would result in a decrease in respiratory diseases in young children, who would not be exposed to the dampness of the early morning.

Medizinische Welt, Berlin

2: 1521-1556 (Oct. 13) 1928

*Vitamins and Cancer. R. Erdmann and E. Haagen.—p. 1521. C'td.
*Bread as Sole Article of Diet. M. Hindhede.—p. 1524.
Therapeutic Properties of Genital Glands of Lower Vertebrates. C. Ceni.—p. 1526.
Treatment of Nonpuerperal Inflammatory Diseases of Female Genital Organs. G. Döderlein.—p. 1529. C'td.
Cure of Stuttering by Hyposis. J. Donath.—p. 1532.
Paralysis of Median Nerve Following Paravenous Injection of Calcium. S. Frankl.—p. 1533.
Relations Between Chemical Composition and Pharmacologic Action of Cardiac Remedies. F. Lebermann.—p. 1534.

2: 1557-1592 (Oct. 20) 1928. Partial Index

Dengue in Greece. P. Papamarkou.—p. 1557.
*Vitamins and Cancer. R. Erdmann and E. Haagen.—p. 1560. C'cn.
Symbolism of Pathopsychology and of Folk Customs. B. Götz.—p. 1562.
Treatment of Nonpuerperal Inflammatory Diseases of Female Genital Organs. G. Döderlein.—p. 1563. C'cn.
Importance of Bismuth Salts in Therapy. A. Bresser.—p. 1574.
Symbion Bacterium Xylinum and Schizosaccharomyces Pombe: Therapeutic Value. M. Bing.—p. 1576.

Vitamins and Cancer.—The experiments on rats carried out by Erdmann and Haagen lead them to conclude that the alternation of a diet rich in vitamins with a diet with unbalanced vitamin content in which vitamin B is in excess favors tumor formation. Such an alternation causes a loosening of cell combinations, particularly in the reticulo-endothelial apparatus, which favors collections of wandering cells as reaction to external irritations. The morphologic structure of a resulting tumor will be determined by the tissue involved in the reaction focus.

Bread as Sole Article of Diet.—Under Hindhede's observation, two men lived on a diet of whole wheat bread and margarine for 261 days, with the exception of the Christmas and Whitsuntide vacations of twenty-two and fifteen days, respectively, when vegetables were added, and a period of eighteen days during which strawberries and milk were taken. The grain was ground coarsely and baked at home. The men worked part time in the laboratory and part time at garden work. A positive protein balance was maintained during practically the entire period, digestion was good and the men felt well and vigorous. A similar experiment was attempted with white bread. The men lost strength and energy rapidly, and headaches, dizziness and disturbances of vision developed. The difference, Hindhede believes, lies in the bran, which contains protein of high value to supplement the inferior protein contained in the kernel. He found that bran is digested as thoroughly by man as by the domestic animals.

Münchener medizinische Wochenschrift, Munich

75: 1705-1746 (Oct. 5) 1928

*Bacteriology of Bile Tract. K. L. Pesch and V. Hoffmann.—p. 1705.
Furuncles and Carbuncles. H. Heinlein.—p. 1707.
Preparation of Pollen Extracts for Use in Desensitization Procedures. W. Grünewald.—p. 1709.
*Treatment of Old Congenital Hip Dislocation. P. Bade.—p. 1711.
Explantation Experiments with Dried and Revivified Hearts of Human and Chicken Embryos. B. D. Morosow.—p. 1713.
Plethora Abdominis. A. Strubell-Harkort.—p. 1714.
Macroscopic or Colposcopic Diagnosis of Leukoplakia of Portio? H. Hinselmann.—p. 1714.
*Effect of Fructovegetable Diet on Hemoglobin. M. E. Bircher.—p. 1715.
General Principles in Treatment of Diabetes. T. Weiss.—p. 1716. C'td.
Preservation of Bacteria; Culture Mediums for Typhoid and Paratyphoid Bacilli. Schmidt.—p. 1719.
Cure of Aneurysm of Carotid Artery by Bandage and Pad. E. Moos.—p. 1719.
*Death as Result of Clysma. J. Brock.—p. 1720.
Rapid Method of Filling Autovaccine Ampules. T. Kertész.—p. 1721.

Bacteriology of Bile Tract.—Pesch and Hoffmann's investigations confirmed the older view that the rôle played by the staphylococcus in the production of cholecystitis and cholangeitis is a subordinate one.

Treatment of Old Congenital Hip Dislocation.—By osteotomy and insertion of a piece of ivory, the acetabulum is "sprung" in the region of the V-shaped cartilage, with resultant displacement of its iliac portion, bringing the anterior spine into a lateral position and the portion formed by the os pubis and the descending branch of the ischium into a medial position. The acetabular concavity is deepened and the upper part of the roof is given a more rounded shape. Bade worked out the technic on the cadaver and has recently performed the operation on a patient, aged 27, with apparent success.

Effect of Fructovegetable Diet on Hemoglobin.—In patients on a fructovegetable (chiefly raw) diet, Bircher noted a distinct tendency to increased formation of hemoglobin. The influence of the diet on the blood viscosity in the sense of normalization, was, however, even greater than on the hemoglobin, and in cases in which the regulation of the viscosity required its decrease there was a relative decrease in the hemoglobin also.

Death as Result of Clysma.—Brock reports a case in which the emptying of a greatly overfilled intestine by clysma in a woman in the puerperium so disturbed the equilibrium of the distribution of the blood in the body as to bring about anemia of the brain and cause death.

75: 1747-1788 (Oct. 12) 1928

*Hereditary Anomalies of Buccal Cavity. H. W. Siemens.—p. 1747.
*Obesity and Lipoid Content of Blood. H. Knauer.—p. 1750.
Histamine Test and Prognosis of Achylia. N. Henning.—p. 1752.
Conservative Treatment of Chronic Suppurating Inflammation of Antrum of Highmore. R. Mittermaier.—p. 1753.
Blood Groups and Therapeutic Malaria. G. Hopf.—p. 1755.
Topical Diagnosis of Tuberculosis of Spine. A. Schuberth.—p. 1756.
Treatment of Disturbances of Menopause. F. Ertl and C. Mayer.—p. 1757.
Exarticulation of Presenting Arm of Fetus Erroneously Believed Dead. H. Futh.—p. 1758.
Ictericia—Infectious Disease of Biliary Tract Plus Stone Formation. Strubell-Harkort.—p. 1759.
Müller's Conglobation Reaction in Serodiagnosis of Syphilis. H. Gross.—p. 1760.
Glacial Acetic Acid and Sulphuric Acid Test in Cerebrospinal Fluid in Diseases of Central Nervous System. W. Baumann.—p. 1761.
*Effect of Fructovegetable Diet on Blood Pressure. M. E. Bircher.—p. 1762.
Enema Instead of Drop Infusion After Operation. W. Gross.—p. 1762.
Radium Brine Spring of Heidelberg. Hammer.—p. 1763.
Ultrashort Electromagnetic Waves for Diathermy and Therapy. Noack.—p. 1763.
General Principles in Treatment of Diabetes. T. Weiss.—p. 1764. C'cn.
Treatment with Liver as Advocated by Hippocrates. A. Bier.—p. 1767.

Hereditary Anomalies of Buccal Cavity.—Siemens had two examinations made of the mouths of twins in the schools of Munich. In the first examination eighty-eight pairs of twins were examined; in the second, 106. Some of the same children were included in both examinations. In a number of cases Carabelli tubercle was found in only one twin, which, he says, disposes of the old theory of its syphilitic origin. Symmetrical absence of some of the teeth appeared to be under the influence of dominant hereditary factors; on the other hand, heredity did not appear to have any part in the production of asymmetrical absence of teeth; nor was its influence paramount in the production of symmetrical torsion of teeth. As regards mesodistal tooth anomalies, the cases in which a certain anomaly was found in only one of a pair of twins were about as many as those in which it was found in each of the twins. Anomalies of the verticofrontal teeth, on the contrary, appeared to be almost wholly under the influence of heredity. The hereditary origin of furrowed tongue was confirmed.

Obesity and Lipoid Content of Blood.—The blood lipoid of pigs and geese under fattening treatment was investigated by Knauer. He found that when the amount of food was increased gradually and the animals gained regularly in weight, there was a constant decrease of all the lipoid fractions. Under forced fattening with rapid gain in weight the blood fat fell likewise, but if the animals maintained an even weight while the fattening treatment was continued, the fat of the blood increased to an enormous extent. The animals appeared sick and were short of breath and apathetic. The animal organism is apparently able to attain to an increasingly high degree the capacity of withdrawing fat from the blood into the tissues. If anything occurs to disturb the capacity of the tissues to take up the fat, the blood fat increases proportionally. The application of these experimental observations to obesity in human beings on the basis of endocrine disturbance of lipoid metabolism is discussed.

Effect of Fructovegetable Diet on Blood Pressure.—In Bircher's investigations on about 200 persons, a fructovegetable diet, mainly raw, tended to restore the blood pressure to normal. A low blood pressure was increased; a high pressure reduced.

Wiener klinische Wochenschrift, Vienna

41: 1421-1452 (Oct. 11) 1928

*Diagnosis of Tuberculous Epididymitis by Tuberculin Reaction in Urethra. M. Oppenheim.—p. 1421.
Joint Diseases and Glands. J. Wiesel.—p. 1424.
Ventricular Fibrillation with Retrogression in Animal Experiments. R. Demel, S. Jellinek and H. Kunz.—p. 1426.
*Treatment of So-Called Pseudorecurrence After Cholecystectomy. G. Blass.—p. 1429.
First Institute for Experimental Roentgen Technic. G. Holzknecht and G. Spiegler.—p. 1430.
Prevention and Treatment of Infectious Diseases of Childhood. E. Nobel.—p. 1433.
Athletics in Prevention of Tuberculosis. L. Hofbauer.—p. 1438.
Infundibular Thorax and Shape of Heart. R. Pohl.—p. 1439.
*Structure of Animal and Human Tumor Cells. B. Lipschütz.—p. 1439. C'cn.
"Cosmetic Removal of Wrinkles." Halla.—p. 1442.
Brain Hemorrhage and Brain Softening. G. Stiefler.—p. 1442.
Treatment of Pulmonary Emphysema. G. Spengler.—p. 1444.

Diagnosis of Tuberculous Epididymitis by Tuberculin Reaction in Urethra.—In Oppenheim's old method, with which he failed to obtain a reaction, the old tuberculin was introduced only into the fossa navicularis, which is lined with stratified squamous cell epithelium, which is often cornified. In his recent attempts he brought the old tuberculin into the pars pendula penis, the lining of which, like that of the conjunctiva, consists of stratified columnar epithelium. Twenty-five patients were tested by this method. Ten gave a distinctly positive reaction. In nine of these tuberculosis of the epididymis existed or was suspected. Of the fifteen cases in which the reaction was negative or uncertain, eleven were of gonorrhea; two, of questionable gonorrhea; one, of hydrocele, and one, of syphilis of the testis. One patient, who gave a strongly positive reaction, had tuberculosis of the skin.

Treatment of So-Called Pseudorecurrence After Cholecystectomy.—To prevent congestion of the ducts with bile from spastic contraction of Oddi's sphincter after cholecystectomy, Blass uses duodenal tubage with introduction of magnesium sulphate. His method is to introduce a dose of papaverine dissolved in water into the duodenum through the tube immediately before the magnesium sulphate. In continuing the treatment, it is not essential to use the tube; the papaverine and magnesium sulphate may be given by mouth, the papaverine three minutes before the magnesium sulphate. The patient should then lie for half an hour on the right side. A case illustrating the indications for and the results of the treatment is reported.

Structure of Animal and Human Tumor Cells.—Lipschütz describes structures which he believes are specific for tumor cells. The blastomas examined by him represent, he

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maintains, a cytologically exactly defined disease of the animal cell, a cell disease *sui generis*. He suggests that the cell structures observed by him may be the visible expression of Askanazy's "secondary permanent irritation anchored to the cell."

Zentralblatt für Chirurgie, Leipzig

55: 2753-2816 (Nov. 3) 1928. Partial Index

*Plastic Operation for Saddle Nose. N. N. Petrow.—p. 2755.
Enteroliths. A. Drescher.—p. 2758.
Technic of Resection of Temporary Artificial Fistulas of Small Intestine. A. Kantor.—p. 2761.
Free Bodies in Joint and Dislocation of Patella. F. Mandl.—p. 2763.
*Osteotomy Forceps for Operations on Toes and Metatarsals. H. Bär.—p. 2765.
Modification of Stille's Bit and Drill for Wire Extensions. H. Steiner.—p. 2768.
*Value of Dry Diet in Treatment of Tuberculosis of Bones and of Lungs. F. Birkenhauer.—p. 2769.

Plastic Operation for Saddle Nose.—Petrow frees the scar or the saddle from the underlying tissue of the nasal bridge and then passes under it a pedicled flap of skin previously raised from the left upper arm flexor surface. This flap is long and narrow. By means of two sutures placed in its tip, it is drawn up into the nose through the nares, the skin side down and the raw or denuded side up. This fresh surface comes in contact with a similar surface on the under side of the nasal bridge, and the skin surface is directed toward the nasal cavity. By means of two Reverdin needles passed through the upper part of the bridge of the nose, the two sutures in the tip of the flap are securely anchored wherever desired, being tied on the outside over a piece of gauze. The cavity of the nose is packed with gauze to secure good contact between the flap and the overlying tissue. The position of the arm is maintained by means of a light plaster-of-paris cast. After about twelve or fourteen days, the cast is removed and the pedicle of the skin flap is divided. A few days later the excess of flap in the nose is trimmed properly. A case is cited to show that the method is well worth while.

Osteotomy Forceps.—Instead of performing osteotomy on the toe phalanges and the metatarsals with the aid of chisel and hammer, Bär has devised special cutting forceps. Their use is described. The superiority of these instruments over those previously used is evident. There is less splintering of bone; the operation proceeds more smoothly and much more rapidly; healing is more rapid.

Value of Dry Diet in Treatment of Bone Tuberculosis.—Birkenhauer has employed this diet in forty-five cases of tuberculosis of bones alone, in cases combined with skin and gland tuberculosis, and in secondary pulmonary tuberculosis. Some of the patients were previously well nourished; others were not. The author failed to see any favorable influence on healing from the use of this diet; in fact, he feels that it did harm because it abstracted fluids from tissues that were already not well supplied with fluid. In badly nourished patients it failed to stimulate the appetite and they steadily lost weight. The author has not been encouraged to give the diet further trials.

55: 2881-2944 (Nov. 17) 1928

Cases of Inguinal and Femoral Hernias Containing Ovary, Tube and Horn of Uterus. H. Hilarowicz.—p. 2881.
Reinfusion of Intra-Abdominal Hemorrhages. F. Dannheisser.—p. 2884.
Difficulty of Diagnosing Echinococcus Infestation of Kidney; Surgical Treatment. W. Stark.—p. 2888.
*Spontaneous Bursting of Gallstone. C. Hammesfahr.—p. 2893.
Heminephrectomy for Double Kidney. W. Heckenbach.—p. 2895.
Treatment of Clubfoot. C. R. H. Rabl.—p. 2901.
Care of Permanent Suprapubic Fistula. G. Practorius.—p. 2903.
Resection of Stomach at Cardia. C. Hörhammer.—p. 2904.

Spontaneous Bursting of Gallstone.—Hammesfahr cites a case of cholecystectomy in which he discovered that one of the stones in the gallbladder had "burst open." It was about the size of a pea, but was separated into halves by a walnut-sized mass which projected from the stone and was firmly fixed to it. On chemical examination of the stone it was found to consist mainly of calcium; the mass consisted of cholesterol. The author assumes that the stone originally contained a cholesterol crystal and that this crystal grew in size and eventually burst the stone. He thinks that such an observation cannot be a rare one.

Zentralblatt für Gynäkologie, Leipzig

52: 2561-2624 (Oct. 6) 1928

No Regulation of Propagation Without Feeling of Responsibility. H. Sellheim.—p. 2562.
Results Obtained on Uterus in Vitro Correspond to Observations on Uterus in Vivo. H. Knaus.—p. 2566.
Antigens in Gravid Uterus, Placenta and Fetal Tissues. E. Ishikawa.—p. 2571.
Questions Concerning Existence of Intervillous Spaces and Blood Circulation in Them. W. Stoeckel.—p. 2578.
*Subsistence Diet in Treatment of Metabolic Disturbances in Pregnancy. P. Rissmann.—p. 2584.
Value of Roentgenologic Examination in Diagnosis of Genital Fistulas. H. Nahmmacher.—p. 2586.
*Isolated Torsion of Normal Ovary. A. W. Bauer.—p. 2590.
Value of Blood Group Determination in Tissue Transplantation. E. M. Schwarzmann.—p. 2593.
Cysts of Uterus. C. Stanca.—p. 2602.

Subsistence Diet in Treatment of Metabolic Disturbances in Pregnancy.—Rissmann obtained good results in metabolic disturbances in pregnancy, with a subsistence diet (oatmeal water the first day; oatmeal water and fruit juice the second day). By this simple method he even cured pregnant women with edema, high blood pressure, and kidney disease so marked that some physicians would have advised cesarean section.

Isolated Torsion of Normal Ovary.—Although torsion of ovarian tumors is quite common, only four cases of torsion of a normal ovary have been reported during the last twenty years. To these Bauer adds a fifth case which is particularly interesting by reason of the fact that the ovarian ligament was short and thick.

Nederlandsch Maandschrift v. Geneeskunde, Leyden

15: 331-386, 1928

*Peculiar Case of Anemia with Bacteriologic Observation. J. Haverschmidt.—p. 331.
*Miliary Tuberculosis of the Skin. E. J. Meijers.—p. 346.
*Peculiar Disturbance of Carbohydrate Metabolism in a Child. S. van Creveld.—p. 349.
Case of Chloroma. J. H. Smidt van Gelder.—p. 360.
*Various Forms of Rickets—Hereditary Factors. E. Gorter.—p. 364.
*Subperiosteal Hemorrhages in an Infant. M. de Bruin.—p. 376.

Peculiar Case of Anemia with Bacteriologic Observation.—A boy, aged 6, was brought to Haverschmidt for paleness and listlessness. The condition was of three years' standing. Reports from another hospital, in which the child had been for a short time two years before, showed that the hemoglobin was then 30 per cent, the erythrocyte count 3,080,000 and the leukocyte count 8,500. A further symptom noted at that time, which still continued, was enlargement of the cervical lymph glands. An organism, presenting peculiar characteristics, had been cultivated from the blood, pharynx and excreta; the patient's blood serum agglutinated this organism in a dilution of 1:800. The parents were healthy, but a brother had died at the age of 11 with severe anemia and a sister had had anemia but recovered. Examination showed that the child's condition had not changed greatly from that noted two years before. The hemoglobin was 25 per cent; the erythrocytes numbered 3,820,000 and showed increased fragility. The leukocyte count was 4,150; there was a marked shifting to the right in Arneth's formula. The abdomen was of normal circumference. The liver was two fingerbreadths below the last rib; the spleen could just be palpated. The Pirquet and Wassermann reactions were negative. Later the Pirquet reaction became positive; Haverschmidt suggests that this may have been from activation of an old focus. An excised lymph gland showed only subacute lymphadenitis, without specific characteristics. A bacillus, resembling the colon bacillus in many respects but differing from it in certain cultural particulars, was isolated from the blood, the pharyngeal mucus and the excreta. The patient's serum agglutinated the bacillus in a dilution of 1:800. The micro-organism killed a white mouse and a guinea-pig in from two to three days. An autovaccine was prepared from the organism and injected once a week. About ten weeks later the organism had disappeared from the blood and a short time after this from the pharynx also. In addition to the vaccine treatment, the child received liver extract, which did not seem to do much good, and arsenic and iron. From the time the vaccine treatment was started, improvement was steady. In three months the hemoglobin rose to 59 per cent, the erythrocyte count to 5,640,000, and the general condition was good.

Miliary Tuberculosis of the Skin.—A child, aged 2, was brought to the clinic with symptoms of meningitis. The father had died of open tuberculosis a short time before. Over the entire skin of the face and of the extremities were strewn round papules, the size of a pinhead. Most of these were crusted over at the center, but in a few cases a vesicle was still visible. The efflorescences bore a striking resemblance to papulonecrotic tuberculids; they were not hemorrhagic. According to the mother, they had been present for about four weeks. On roentgen examination the lungs presented the typical picture of miliary tuberculosis; no tubercles could be discovered in the base of the lungs. The general condition of the child grew rapidly worse, although the tuberculids showed a tendency to heal and new eruptions did not occur. At necropsy a piece of skin, which, however, did not include the most distinct changes, was removed for examination. Under the epithelium, in the cutis, a few giant cells were found. Tubercle bacilli were not seen.

Peculiar Disturbance of Carbohydrate Metabolism in a Child.—Van Creveld reports the case of a boy, aged 7, who from infancy had presented symptoms of dystrophia adiposogenitalis, with a greatly enlarged liver and attacks of periodic vomiting. High-grade hypoglycemia (from 0.030 to 0.046 Gm. of sugar per hundred cubic centimeters of blood) was present, without, however, any of the objective or subjective phenomena associated with hypoglycemia. The urine contained much acetone. Administration of from 30 to 50 Gm. of dextrose, levulose or galactose was not followed by excretion of sugar with the urine, and yet examination of the capillary blood showed that the assimilation of sugar was abnormal. Injection of solution of epinephrine hydrochloride failed to mobilize glycogen but did increase the acidosis. Intake of sugar acted on the respiratory quotient in a normal manner. The fact that the respiratory quotient did not rise above 1 spoke strongly for a rapid conversion of sugar into fat. The acidosis, present in the fasting state, decreased slowly after administration of sugar. From the tests it appears probable that the patient is able to store dextrose as glycogen in the liver, that he can burn sugar, and that the hypoglycemia cannot be explained by particularly rapid burning of carbohydrates. In view of the reaction to epinephrine, insulin was tried. Grave hypoglycemic phenomena occurred at the end of an hour, although the blood sugar, already very low, showed scarcely any reduction. Under dietetic treatment the child has improved. Thyroxin was given without result.

Various Forms of Rickets—Hereditary Factors.—Gorter cites cases to illustrate the similarity between fragilitas ossium and certain forms of rickets, which he styles periosteogenous forms. He also reports a case of chondrodystrophic disease that presented a likeness to certain chondrogenous forms of rickets. He suggests that hereditary factors have to do with the form that rickets takes in the individual child.

Subperiosteal Hemorrhages in an Infant.—A child, aged 7½ months, developed an acute swelling of both lower extremities. The roentgenogram showed diffuse swelling of both femurs and tibias, manifested as a broad shadow between the periosteum and the bone, periostitis and new bone formation. Diffuse swelling of the soft parts was also shown. Results of examination of the blood were in the main normal, but the reaction for thrombasthenia was positive in this child and in the twin sister. The latter had hematuria. De Bruin believes that the condition in the lower extremities of his patient was due to subperiosteal hemorrhages. The condition differed widely from Glanzmann's hereditary hemorrhagic thrombasthenia, one important point being that in de Bruin's patient the retractility of the blood clot was normal. The swelling of the extremities gradually went down. Both twins had rickets.

Nederlandsch Tijdschrift v. Geneeskunde, Haarlem

72: 5039-5130 (Oct. 13) 1928. Partial Index

Hematuria. P. R. Michael.—p. 5040.
*Function of Scrotum; Necessity of Treatment for Retentio Testis. R. J. Harrenstein.—p. 5047.
*Precarcinomatous Lesion of Vocal Cords. C. E. Benjamins.—p. 5059.
Bennett's Fracture. L. Havinga.—p. 5068.
Psychosis as Result of Lead Poisoning. C. H. Ribbeling.—p. 5076.

Function of Scrotum; Necessity of Treatment for Retentio Testis.—In sixteen boys, aged from 1 to 11 years, Harrenstein found the temperature in the scrotum considerably lower than that in the abdomen. The maximum difference noted was 7.8 Celsius; the minimum, 2.7 Celsius. The skin of the scrotum is thinner than ordinary skin, and subcutaneous fat is absent. The thin layer of smooth muscle (tunica dartos) present in the scrotal integument provides for regulation of the temperature of its contents. In a warm atmosphere, the muscle expands, the distance between the scrotal contents and the rest of the body is increased, and the scrotum presents a larger surface for loss of heat; in a cold atmosphere (for instance, in swimming) the muscle contracts and the contents are held close against the body. Harrenstein suggests that the cooler temperature found in the scrotum as compared with the abdomen is necessary for the proper development of the testis in relation to the production of spermatozoa.

Precarcinomatous Lesion of the Vocal Cords.—A man, aged 72, came to Benjamins complaining of hoarseness. He had an old catarrh of the throat and had been hoarse for years, but in the last four months the hoarseness had greatly increased. With the laryngeal mirror Benjamins discovered a white oval swelling, with irregular surface, on the right vocal cord. A diagnosis of circumscribed hyperkeratosis, possibly with malignant degeneration, was made. A piece of tissue was excised for examination. The microscopic picture was that of papilloma, but in a number of places on the margin of the connective tissue there were groups of cells that were atypical. These cell nests were malignant in appearance, but since the dividing line between epithelium and connective tissue was nowhere broken through and infiltration of the deeper tissues had not yet begun, it was too early to speak of cancer. In the early stages of experimental tar carcinoma, similar pictures are seen. Thus, Benjamins points out, the covering of the vocal cords presents the character of skin epithelium not only in the fully developed stage of cancer but also in the precarcinomatous stage. He raises the question whether the epithelium of the vocal cords is of ectodermal origin.

Hospitalstidende, Copenhagen

71: 991-1016 (Sept. 13) 1928

Surgical Diathermy in Malignant Tumors in Upper Air Passages. E. Schmiegelow.—p. 991. C'en.
*Psychoses Associated with Gastric Achylia. E. J. Warburg and S. Jørgensen.—p. 1001. C'td.

71: 1017-1044 (Sept. 20) 1928

*Psychoses Associated with Gastric Achylia. E. J. Warburg and S. Jørgensen.—p. 1017. C'tn.

71: 1045-1072 (Sept. 27) 1928

*Psychoses Associated with Gastric Achylia. E. J. Warburg and S. Jørgensen.—p. 1045. C'tn.
*Pathogenic Micro-Organisms in Air in Obstetric Wards. N. F. Gregersen.—p. 1064.

71: 1073-1100 (Oct. 4) 1928

Frequency of Osteitis After Osteosynthesis. K. Barmwater.—p. 1078.
*Psychoses Associated with Gastric Achylia. E. J. Warburg and S. Jørgensen.—p. 1094. C'en.

Psychoses and Neurasthenias Associated with Gastric Achylia and Megalocytosis and Relation of Syndrome to Pernicious Anemia.—On the basis of their observations and study of the literature, Warburg and Jørgensen affirm that there is associated with gastric achylia, and possibly due to it, a chronic disorder, in some cases with neuroses appearing at an early stage, in numerous cases with neurasthenia, these conditions frequently being accompanied by slight spinal symptoms, glossitis and megalocytosis. Pernicious anemia is a late and rare stage in the disturbance, while anemias with low color index are not infrequently seen at an earlier period. The neurasthenias are characterized by exhaustion and mental irritability; the psychoses are often marked by a dulness amounting to amentia; acute hallucinations are common, and occasionally Korsakoff's psychoses occur and the course resembles that of general paresis. In a considerable number of these cases improvement may be expected at all stages of the disorder on treatment with massive doses of hydrochloric acid (Bie) and liver diet (Minot and Murphy).

Pathogenic Microbes in Air in Obstetric Wards.—Gregersen reports that the results of his investigations definitely exclude the danger of infection from the air in obstetric wards under ordinary conditions.

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